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QUESTION BANK FOR 10TH STANDARD

(BASED ON CBSE OLD QUESTION PAPERS)

SUBJECT: MATHEMATICS

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Sl. No	Unit name	No.of questions	Page number
1	A.P	103	2-7
2	TRIANGLES	24	8-12
3	PAIR OF LINEAR Eqs.IN TWO VARIABLES	22	12-14
4	CIRCLES	36	14-18
5	AREAS RELATED TO CIRCLES	56	19-26
6	CONSTRUCTIONS	35	27-29
7	COORDINATE GEOMETRY	107	29-37
8	REAL NUMBERS	11	37
9	POLYNOMIALS	33	37-39
10	QUADRATIC EQUATIONS	70	39-44
11	INTRODUCTION TO TRIGONOMETRY	40	44-46
12	SOME APPLICATIONS OF TRIGONOMETRY	74	46-53
13	STATISTICS	40	53-56
14	PROBABILITY		
15	SURFACE AREAS AND VOLUMES	102	56-64
Total =		753	

Unit -1. ARITHMETIC PROGRESSION

1 Mark:

1. Find the 17th term from the end of the AP: 1,6,11,16.....211,216.
CBSE Sample Paper 2017
2. What is the common difference of an A.P. in which $a_{21}-a_7=84$?
Mathematics 2017 (30/1)
3. Find the tenth term of the sequence $\sqrt{2}, \sqrt{8}, \sqrt{18}, \dots$
CBSE Sample Paper 2016
4. For what value of k will the consecutive terms $2k+1, 3k+3$ and $5k-1$ form an A.P.?
CBSE 2016, Foreign (30/2/1)
5. Find the 9th term from the end (towards the first term) of the A.P. 5,9,13,.....,185.
CBSE 2016, Delhi (30/1/1)
6. For what value of k will $k+9, 2k-1$ and $2k+7$ are the consecutive terms of an A.P.?
CBSE 2016, Outside Delhi (30/1)
7. If the common difference of an AP is 3, then what is $a_{15}-a_9$?
CBSE Sample Paper 2015
8. Find the 25th term of the A.P. $-5, -5/2, 0, 5/2, \dots$
CBSE 2015, Foreign (30/2/1)
9. If $k, 2k-1$ and $2k+1$ are three consecutive terms of an A.P., the value of k is
A) 2 B) 3 C) -3 D) 5 CBSE 2014 (30/1), (30/2), (30/3)
10. The common difference of the AP $1p, 1-pp, 1-2pp, \dots$ is :
A) p B) $-p$ C) -1 D) 1 CBSE 2013, Delhi (30/1/1)
11. If the n th term of an A. P. is $(2n+1)$, then the sum of its first three terms is
A) $6n+3$ B) 15 C) 12 D) 21 CBSE 2012, Outside Delhi (30/1)
12. The next term of the A. P. $\sqrt{18}, \sqrt{50}, \sqrt{98}, \dots$ is
A) $\sqrt{146}$ B) $\sqrt{128}$ C) $\sqrt{162}$ D) $\sqrt{200}$ CBSE 2012, Foreign (30/2/1)
13. The sum of first 20 odd natural numbers is:
A) 100 B) 210 C) 400 D) 420 CBSE 2012, Delhi (30/1/1)
14. If the common difference of an A.P. is 3, then $a_{20}-a_{15}$ is...
A) 5 B) 3 C) 15 D) 20 CBSE 2011 Outside Delhi (30/1)
15. The value of $a_{30}-a_{20}$ for the A.P. 2,7,12,17,... is ...
A) 100 B) 10 C) 50 D) 20 CBSE 2011, Foreign (30/2/1)
16. In an AP, if $d=-2, a_5=0$, then the value of a is....
A) 10 B) 5 C) -8 D) 8 CBSE 2011, Delhi (30/1/1)
17. If the sum of first m terms of an A.P. is $2m^2+3m$, then what is its second term?
CBSE 2010, Foreign (30/2/1)
18. If the sum of first p terms of an A.P., is ap^2+bp , find its common difference.
CBSE 2010, Delhi (30/1/1)
19. If 45, 2 are three consecutive terms of an A.P., then find the value of a .
CBSE 2009, Outside Delhi (30/1)
20. For what value of k , are the numbers $x, 2x+k$ and $3x+6$ three consecutive terms of an A.P.?
CBSE 2009, Foreign (30/2/1)
21. For what value of p , are $2p-1, 7$ and $3p$ three consecutive terms of an A.P.?
CBSE 2009, Delhi (30/1/1)

22. The first term of an A.P. is p and its common difference is q . Find its 10th term.

CBSE 2008 (30/2/1), (30/2/2)

23. Which term of the sequence 114, 109, 104, ... is the first negative term?

CBSE Sample Paper I 2008

2 Marks:

1. Find the sum of all natural numbers that are less than 100 and divisible by 4.

CBSE Sample Paper 2017

2. If seven times the 7th term of an A.P. is equal to eleven times the 11th term, then what will be its 18th term?

CBSE 2017, Foreign (30/2/1)

3. Find how many integers between 200 and 500 are divisible by 8. **CBSE 2017, Delhi**

4. Which term of the progression $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$ is the first negative term?

CBSE 2017, Outside Delhi

5. How many two digit numbers are divisible by 7?

CBSE Sample Paper 2016

6. If the ratio of sum of the first m and n terms of an A.P. is $m^2:n^2$, show that the ratio of its m th and n th terms is $(2m-1):(2n-1)$.

CBSE 2016, Foreign (30/2/1)

7. How many terms of the A.P. 18, 16, 14, be taken so that their sum is zero?

CBSE 2016, Delhi (30/1/1)

8. The 4th term of an A.P. is zero. Prove that the 25th term of the A.P. is three times its 11th term.

CBSE 2016, Outside Delhi (30/1)

9. Find the 4th term from the end of the A.P. $-11, -8, -5, \dots, 49$.

CBSE Sample Paper 2015

10. In an AP, if $S_5 + S_7 = 167$ and $S_{10} = 235$, then find the AP, where S_n denotes the sum of its first n terms.

CBSE 2015, Outside Delhi (30/1)

11. The fourth term of an A.P. is 11. The sum of the fifth and seventh terms of the A.P. is 34. Find its common difference.

CBSE 2015, Foreign (30/2/1)

12. Find the middle term of the A.P. 6, 13, 20, ..., 216. **CBSE 2015, Delhi (30/1/1)**

13. Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.

CBSE 2014 (30/1), (30/2), (30/3)

14. How many three-digit natural numbers are divisible by 7? **CBSE 2013 Delhi (30/1/1)**

15. How many two-digit numbers are divisible by 3? **CBSE 2012, Outside Delhi (30/1)**

16. In an AP, the first term is 12 and the common difference is 6. If the last term of the A.P. is 252, find its middle term.

CBSE 2012, Foreign (30/2/1)

17. Find the sum of all three digit natural numbers, which are multiples of 11.

CBSE 2012, Delhi (30/1/1)

18. Find how many two-digit numbers are divisible by 6. **CBSE 2011, Outside (30/1)**
 19. Find whether -150 is a term of the AP $17, 12, 7, 2, \dots$? **CBSE 2011, Delhi (30/1/1)**
 20. In an AP, the first term is -4 , the last term is 29 and the sum of all its terms is 150 . Find its common difference. **CBSE 2010 Foreign (30/2/1)**
 21. In an AP, the first term is 2 , the last term is 29 and sum of the terms is 155 . Find the common difference of the A.P. **CBSE 2010 Delhi (30/1/1)**
 22. Which term of the A.P. $3, 15, 27, 39, \dots$ will be 120 more than its 21 st term? **CBSE 2009 Outside Delhi (30/1)**
 23. The 17 th term of an A.P. exceeds its 10 th term by 7 . Find the common difference. **CBSE 2009 Foreign (30/2/1)**
 24. If S_n , the sum of first n terms of an A.P. is given by $S_n = 3n^2 - 4n$, then find its n th term. **CBSE 2009 Delhi (30/1/1)**

3 Marks:

1. The sum of first six terms of an A.P. is 42 . The ratio of its 10 th term to its 30 th term is $1:3$. Find the first term of the A.P. **CBSE Sample Paper 2017**
 2. Find the sum of the following series:
 $5 + (-41) + 9 + (-39) + 13 + (-37) + 17 + \dots + (-5) + 81 + (-3)$. **CBSE 2017, Foreign (30/2/1)**
 3. If m th term of an A.P. is $1n$ and n th term is $1m$, then find the sum of its first mn terms. **CBSE 2017, Delhi (30/1/1)**
 4. Find the sum of n terms of the series $(4-1n) + (4-2n) + (4-3n) + \dots$ **CBSE 2017, Delhi (30/1/1)**
 5. The first term of an A.P. is 5 , the last term is 45 and the sum of all its terms is 400 . Find the number of terms and the common difference of the A.P. **CBSE 2017, Outside Delhi (30/1)**
 6. In an A.P., the sum of first n terms is $3n^2 + 13n$. Find the 25 th term. **CBSE Sample Paper 2016**
 7. The ninth term of an A.P. is equal to seven times the second term and twelfth term exceeds five times the third term by 2 . Find the first term and the common difference. **CBSE Sample Paper 2016**
 8. Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1st and 4th) to the product of means (2nd and 3rd) is $5:6$. **CBSE 2016, Foreign (30/2/1)**
 9. If the sum of first 7 terms of an A.P. is 49 and that of its first 17 terms is 289 , find the sum of first n terms of the A.P. **CBSE 2016, Delhi (30/1/1)**
 10. If the ratio of the sum of first n terms of two A.P.s is $(7n+1):(4n+27)$, find the ratio of their m th terms. **CBSE 2016, Outside Delhi (30/1)**
 11. Find the sum of the two middle most terms of the AP $-43, -1, -23, \dots, 413$. **CBSE Sample Paper 2015**
 12. The 14 th term of an AP is twice its 8 th term. If its 6 th term is -8 , then find the sum of its first 20 terms. **CBSE 2015, Outside Delhi (30/1)**

13. In an A.P., if the 12th term is -13 and the sum of its first four terms is 24, find the sum of its first ten terms.
CBSE 2015, Foreign (30/2/1)
14. If S_n , denotes the sum of first n terms of an A.P., prove that $S_{12}=3(S_8-S_4)$.
CBSE 2015, Delhi (30/1/1)
15. The sum of the first seven terms of an AP is 182. If its 4th and the 17th terms are in the ratio 1:5, find the AP.
CBSE 2014, Outside Delhi (30/3)
16. The sum of the 2nd and the 7th terms of an AP is 30. If its 15th term is 1 less than twice its 8th term, find the AP.
CBSE 2014, Outside Delhi (30/2)
17. The sum of the 5th and the 9th terms of an AP is 30. If its 25th term is three times its 8th term, find the A.P.
CBSE 2014, Outside Delhi (30/1)
18. Find the number of terms of the AP 18,15,12,9,..., -49 and find the sum of all its terms.
CBSE 2013, Delhi (30/1/1)
19. Find the sum of all multiples of 7 lying between 500 and 900.
CBSE 2012, Outside Delhi (30/1)
20. Find the sum of first 40 positive integers divisible by 6. CBSE 2012, Foreign (30/2/1)
21. If 4 times the fourth term of an A. P. is equal to 18 times its 18th term, then find its 22nd term.
CBSE 2012, Foreign (30/2/1)
22. The 17th term of an AP is 5 more than twice its 8th term. If the 11th term of the AP is 43, then find the n th term.
CBSE 2012, Delhi (30/1/1)
23. Find an A.P. whose fourth term is 9 and the sum of its sixth term and thirteenth term is 40.
CBSE 2011, Outside Delhi (30/1)
24. Find the sum of first n terms of an A.P. whose n th term is $5n-1$. Hence find the sum of first 20 terms.
CBSE 2011, Foreign (30/2/1)
25. Find the value of the middle term of the following AP
 $-6, -2, 2, \dots, 58$.
CBSE 2011, Delhi (30/1/1)
26. Determine the AP whose fourth term is 18 and the difference of the ninth term from the fifteenth term is 30.
CBSE 2011, Delhi (30/1/1)
27. The sum of the first sixteen terms of an A.P. is 112 and the sum of its next fourteen terms is 518. Find the A.P.
CBSE 2010, Foreign (30/2/1)
28. In an A.P., the sum of first ten terms is -150 and the sum of its next ten terms is -550 . Find the A.P.
CBSE 2010, Delhi (30/1/1)
29. The sum of first six terms of an arithmetic progression is 42. The ratio of its 10th term to its 30th term is 1:3. Calculate the first and the thirteenth term of the A.P.
CBSE 2009, Outside Delhi (30/1)
30. If 9th term of an A.P. is zero, prove that its 29th term is double of its 19th term.
CBSE 2009, Foreign (30/2/1)
31. The sum of 4th and 8th terms of an A.P. is 24 and sum of 6th and 10th terms is 44. Find A.P.
CBSE 2009, Delhi (30/1/1)
32. For what value of n are the n th terms of two A.P.s 63,65,67,... and 3,10,17... equal?

CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

33. If m times the m th term of an A.P. is equal to n times its n th term, find the $(m+n)$ th term of the A.P.

CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

34. In an A.P., the first term is 8,th term is 33 and sum to first n terms is 123. Find n and d , the common difference.

CBSE 2008, Foreign (30/2/1)

35. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs. 200 for 1st day,, Rs. 250 for second day, Rs. 300 for third day and so on. If the contractor pays Rs. 27750 as penalty, find the number of days for which the construction work is delayed.

CBSE Sample Paper 2008

4 marks:

1. A manufacturer of TV sets produced 600 units in the 3rd year and 700 units in the 7th year. Assuming that, production increases uniformly by a fixed number of units every year. Find

I. The production in 1st year.

II. The production in 10th year.

III. The total production in 7 years.

CBSE Sample Paper 2017

2. If $1+4+7+10+\dots+x=287$, find the value of x . CBSE 2017, Foreign (30/2/1)

3. A child puts one five-rupee coin of her saving in the piggy bank on the first day. She increases her saving by one five-rupee coin daily. If the piggy bank can hold 190 coins of five rupees in all, find the number of days she can continue to put the five-rupee coins into it and find the total money she saved. Write your views on the habit of saving.

CBSE 2017, Foreign (30/2/1)

4. The ratio of the sums of first m and first n terms of an A.P. is $m^2:n^2$. Show that the ratio of its m th and n th terms is $(2m-1):(2n-1)$.

CBSE 2017, Delhi (30/1/1)

5. If the ratio of the sum of the first n terms of two A.Ps is $(7n+1):(4n+27)$, then find the ratio of their 9th terms.

CBSE 2017, Outside Delhi (30/1)

6. The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of youngest boy was 8 years and the ages of rest of participants are having a common difference of 4 months. If the sum of ages of all the participants is 168 years, find the age of eldest participant in the painting competition.

CBSE Sample Paper 2016

7. Reshma wanted to save at least ₹ 6,500 for sending her daughter to school next year (after 12 months). She saved ₹ 450 in the first month and raised her saving by ₹ 20 every next month. How much will she be able to save in next 12 months? Will she be able to send her daughter to the school next year? What value is reflected in this question?

CBSE 2016, Foreign (30/2/1)

8. A thief runs with a uniform speed of 100 m/minute. After one minute a policeman runs after the thief to catch him. He goes with a speed of 100 m/minute in the first minute and increases his speed by 10 m/minute every succeeding minute. After how many minutes the policeman will catch the thief.

CBSE 2016, Delhi (30/1/1)

9. The house in a row are numbered consecutively from 1 to 49. Show that there exists a value of X such that sum of numbers of houses preceding the house numbered X is equal to sum of the numbers of houses following X . **CBSE 2016, Outside Delhi (30/1)**

10. Yasmeen saves Rs.32 during the first month, Rs.36 in the second month and Rs.40 in the third month. If she continues to save in this manner, in how many months she will save Rs.2000, which she has intended to give for the college fee of her maid's daughter. What value is reflected here.

CBSE Sample Paper 2015

11. Find the 60th term of the AP 8,10,12,..., if it has a total of 60 terms and hence find the sum of its last 10 terms. **CBSE 2015, Outside Delhi (30/1)**

12. Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle term separately.

CBSE 2015, Foreign (30/2/1)

13. Ramkali required ₹ 2500 after 12 weeks to send her daughter to school. She saved ₹ 100 in the first week and increased her weekly saving by ₹ 20 every week. Find whether she will be able to send her daughter to school after 12 weeks. What value is generated in the above situation?

CBSE 2015, Delhi (30/1/1)

14. In a school, students decided to plant trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be double of the class in which they are studying. If there are 1 to 12 classes in the school and each class has two sections, find how many trees were planted by the students. Which value is shown in this question?

CBSE 2014 (30/1), (30/2), (30/3)

15. If the sum of first 7 terms of an AP is 49 and that of first 17 terms is 289, find the sum of its first n terms. **CBSE 2013, Delhi (30/1/1)**

16. Find the common difference of an A.P. whose first term is 5 and the sum of its first four terms is half the sum of the next four terms. **CBSE 2012, Outside Delhi (30/1)**

17. The sum of 4th and 8th terms of an A.P. is 24 and the sum of its 6th and 10th terms is 44. Find the sum of first ten terms of the A.P. **CBSE 2012, Foreign (30/2/1)**

18. Sum of the first 14 terms of an AP is 1505 and its first term is 10. Find its 25th term. **CBSE 2012, Delhi (30/1/1)**

19. The first and the last terms of an A.P. are 8 and 350 respectively. If its common difference is 9, how many terms are there and what is their sum?

CBSE 2011, Outside Delhi (30/1)

20. How many multiples of 4 lie between 10 and 250? Also find their sum.

CBSE 2011, Outside Delhi (30/1)

21. In an A.P., if the 6th and 13th terms are 35 and 70 respectively, find the sum of its first 20 terms.

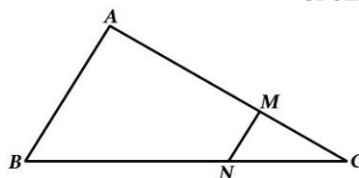
CBSE 2011, Foreign (30/2/1)

Unit-2 TRIANGLES

1 Mark:

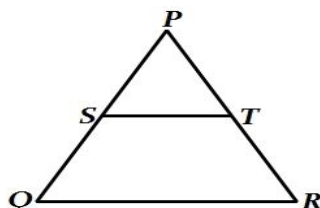
1. In Figure $MN \parallel AB$, $AB = 7.5 \text{ cm}$, $AM = 4 \text{ cm}$ and $MC = 2 \text{ cm}$. Find the length BN .

CBSE 2010, Foreign (30/2/1)



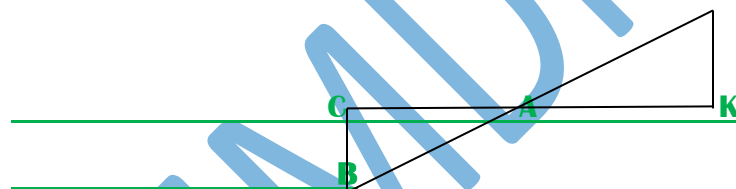
2. In Fig. S and T are points on the sides PQ and PR , respectively of $\triangle PQR$, such that $PT = 2 \text{ cm}$, $TR = 4$ and ST is parallel to QR . Find the ratio of the areas of $\triangle PST$ and $\triangle PQR$.

CBSE 2010, Delhi (30/1/1)



3. In Fig. $\triangle AHK$ is similar to $\triangle ABC$. If $AK = 10 \text{ cm}$, $AB = 3.5 \text{ cm}$ and $HK = 7 \text{ cm}$, find AC .

CBSE 2010, Delhi (30/1/1)



4. In $\triangle LMN$, $\angle L = 50^\circ$ and $\angle N = 60^\circ$. If $\triangle LMN \sim \triangle PQR$, then find $\angle Q$.

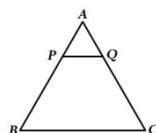
CBSE 2009, Outside Delhi (30/1)

5. In a $\triangle ABC$, $DE \parallel BC$. If $DE = \frac{2}{3}BC$ and area of $\triangle ABC = 81 \text{ cm}^2$, find the area of $\triangle ADE$.

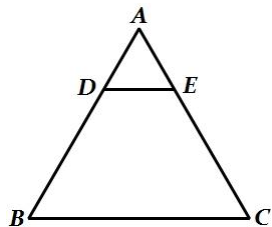
CBSE 2009, Foreign (30/2/1)

6. In Figure, $PQ \parallel BC$ and $AP:PB = 1:2$. Find $\frac{\text{ar}(\triangle APQ)}{\text{ar}(\triangle ABC)}$.

CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

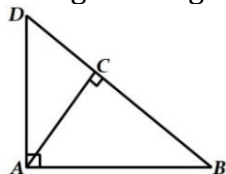


7. In the given figure, DE is parallel to BC and $AD=1\text{ cm},=2\text{ cm}$. What is the ratio of the area of $\triangle ABC$ to the area of $\triangle ADE$? **CBSE Sample Paper I 2008**



2 Marks:

1. In Figure, $\triangle ABD$ is a right triangle, right-angled at A and $AC \perp BD$.



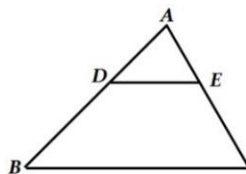
Prove that $AB^2 = BC \times BD$.

CBSE 2009, Outside Delhi (30/1)

2. E is a point on the side AD produced of a parallelogram $ABCD$ and BE intersects CD at F . Show that $\triangle ABE \sim \triangle CFB$.

CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

3. In the figure given below, $DE \parallel BC$. If $AD=2.4\text{ cm},=3.6\text{ cm}$ and $AC=5\text{ cm}$ Find AE .



CBSE Sample Paper II 2008

4. In the figure given below, AC is parallel to BD ,

Is $AECE = ?$ Justify your answer.

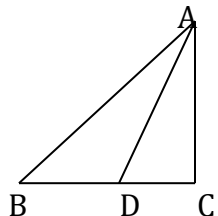
CBSE Sample Paper I 2008

3 Marks:

1. In $\triangle ABC$, right-angled at C , and CM are the two medians. Prove that $4(BL^2 + CM^2) = 5BC^2$.

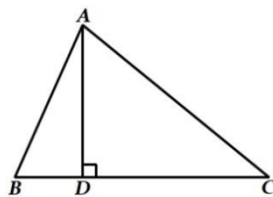
CBSE 2010, Foreign (30/2/1)

2. In Fig. ABC is a right triangle, right angled at C and D is the mid-point of BC . Prove that $AB^2 = 4AD^2 - 3AC^2$.



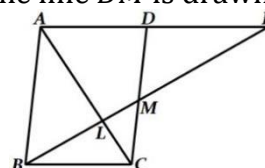
CBSE 2010, Delhi (30/1/1)

3. In Figure, $AD \perp BC$ and $BD = 13CD$. Prove that $2CA^2 = 2AB^2 + BC^2$.



OR

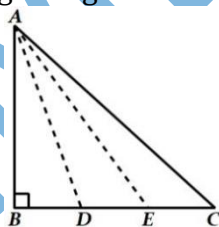
In Figure, M is mid-point of side CD of a parallelogram $ABCD$. The line BM is drawn



intersecting AC at L and AD produced at E . Prove that $EL = 2BL$.

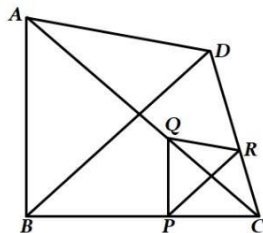
CBSE 2009, Outside Delhi (30/1)

4. In Figure, $\triangle ABC$ is right angled at B . D and E trisect BC . Prove that $8AE^2 = 3AC^2 + 5AD^2$.



CBSE 2009, Foreign (30/2/1)

5. In Figure, two triangles ABC and DBC lie on the same side of base BC . P is a point on BC such that $PQ \parallel BA$ and $PR \parallel BD$. Prove that $QR \parallel AD$.



CBSE 2009, Foreign (30/2/1)

6. In Figure, $\triangle ABC$ is right angled at C and $DE \perp AB$. Prove that $\triangle ABC \sim \triangle ADE$ and hence find the lengths of AE and DE .

OR

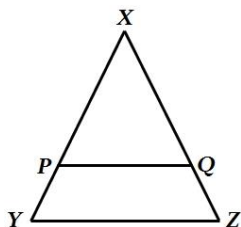
In Figure, $DEFG$ is a square and $\angle BAC = 90^\circ$. Show that $DE^2 = BD \times EC$.

CBSE 2009, Delhi (30/1/1)

7. In Fig., $AD \perp BC$. Prove that $AB^2 + CD^2 = BD^2 + AC^2$

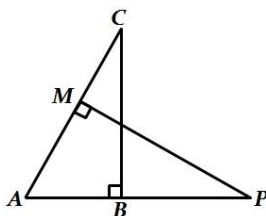
CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

8. In Fig., $XPPY = XQQZ = 3$, if the area of XYZ is 32 cm^2 , then find the area of the quadrilateral $PYZQ$.



CBSE Sample Paper III 2008

9. In the fig., ABC and AMP are right angled at B and M respectively. Prove that $CA \times MP = PA \times BC$



CBSE Sample Paper III 2008

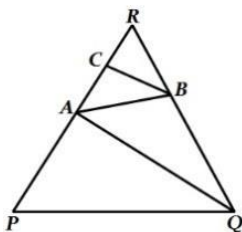
4 Marks:

1. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio.

Using the above, do the following:

In Figure $PQ \parallel AB$ and $AQ \parallel CB$. Prove that $AR^2 = CR \cdot BR$.

CBSE 2010, Foreign (30/2/1)



2. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. The area of the equilateral triangle described

on the side of a square is half the area of the equilateral triangle described on its diagonal.
CBSE 2009, Foreign (30/2/1)

3. Prove that the ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

Use the above theorem, in the following:

The areas of two similar triangles are 81 cm^2 and 144 cm^2 . If the largest side of the smaller triangle is 27 cm , find the largest side of the larger triangle.

CBSE Sample Paper II 2008

4. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Use the above theorem, in the following.

If ABC is an equilateral triangle with $AD \perp BC$, then $AD^2 = 3 DC^2$.

CBSE Sample Paper II 2008.

Unit-3 PAIR OF LINEAR Eqs.IN TWO VARIABLES

1 Mark:

1. Write whether the following pair of linear equations is consistent or not:

$$x + y = 14$$

$$x - y = 4$$

CBSE 2009, Foreign (30/2/1)

2. Find the number of solutions of the following pair of linear equations:

$$x + 2y - 8 = 0$$

$$2x + 4y = 16$$

CBSE 2009, Outside Delhi (30/1)

3. For what value of k , the following pair of linear equations has infinitely many solutions?

$$10x + 5y - (k - 5) = 0$$

$$20x + 10y - k = 0$$

Sample Question Paper III, 2008

2 Marks:

1. Find the value of k for which the following pair of linear equations have infinitely many solutions:

$$2x + 3y = 7; (k - 1) + (k + 2)y = 3k$$

CBSE 2010, Delhi (30/1/1)

2. For what value of k will the following pair of linear equations have no solution?

$$2x + 3y = 9; 6x + (k - 2)y = (3k - 2).$$

CBSE 2010, Foreign (30/2/1)

3. Find the value(s) of k for which the pair of linear equations $kx + 3y = k - 2$ and $12x + ky = k$ has no solution.

CBSE 2009, Delhi (30/1/1)

4. Without drawing the graph, find out whether the lines representing the following pair of linear equations intersect at a point, are parallel or coincident:

$$9x - 10y = 21$$

$$32x - 53y = 72$$

CBSE 2009, Foreign (30/2/1)

5. Without drawing the graphs, state whether the following pair of linear equations will represent intersecting lines, coincident lines or parallel lines:

$$6x - 3y + 10 = 0$$

$$2x - y + 9 = 0$$

Justify your answer.

Sample Question Paper I, 2008

6. Find the solution of the pair of equations:

$$3x + 8y = -1, 1x - 2y, x, y \neq 0$$

Sample Question Paper III, 2008

3 Marks:

1. The sum of numerator and denominator of a fraction is 3 less than twice the denominator. If each of the numerator and denominator is decreased by 1, the fraction becomes $\frac{1}{2}$. Find the fraction.

CBSE 2010, Delhi (30/1/1)

2. Solve the following pair of equations:

$$4x + 3y = 8$$

$$6x - 4y = -5$$

CBSE 2010, Delhi (30/1/1)

3. Solve the following pair of linear equations for x and y :

$$2(ax - by) + (a + 4b) = 0; 2(bx + ay) + (b - 4a) = 0$$

CBSE 2010, Foreign (30/2/1)

4. A number consists of two digits. When the number is divided by the sum of its digits, the quotient is 7. If 27 is subtracted from the number, the digits interchange their places. Find the number.

CBSE 2010, Foreign (30/2/1)

5. Solve the following pair of equations:

$$5x - 1 + 1y - 2 = 2$$

$$6x - 1 - 3y - 2 = 1$$

CBSE 2009, Delhi (30/1/1)

6. Solve for x and y :

$$axb - bya = a + b$$

$$ax - by = 2ab$$

CBSE 2009, Outside Delhi (30/1)

7. The sum of two numbers is 8. Determine the numbers if the sum of their reciprocals is $\frac{1}{815}$.

CBSE 2009, Outside Delhi (30/1)

8. Represent the following pair of equations graphically and write the coordinates of points where the lines intersect y -axis.

$$x + 3y = 6$$

$$2x - 3y = 12$$

CBSE 2008, Foreign (30/2/1)

9. For what value of ' k ' will the following pair of linear equations have infinitely many solutions

$$kx + 3y = k - 3$$

$$12x + ky = k$$

10. Solve for x and y

$$5x + 1y = 2$$

$$6x - 3y = 1, x \neq 0, y \neq 0$$

Sample Question Paper II, 2008

11. Draw the graph of the following pair of linear equations

$$x + 3y = 7$$

$$2x - 3y = 12$$

Hence find the area of the region bounded by the

- $x=0, y=0$ and $2x-3y=12$ Sample Question Paper I, 2008
12. Solve the following system of linear equations graphically:

$$3x+y-12=0$$

$$x-3y+6=0$$

Shadow the region bounded by these lines and the x -axis. Also find the ratio of areas of triangles formed by given lines with x -axis and the y -axis.

Sample Question Paper II, 2008

13. From a pair of linear equations in two variables using the following information and solve it graphically:

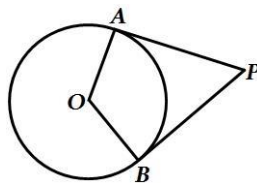
Five years ago, Sagar was twice as old as Tiru. Ten year later Sagar's age will be ten years more than Tiru's age. Find their present ages. What was the age of Sagar when Tiru was born?

Sample Question Paper III, 2008

Unit -4 CIRCLES.

1 MARK:

- If the angle between two tangents drawn from an external point P to a circle of radius a and centre O , is 60° , then find the length of OP .
CBSE 2017, Outside Delhi (30/1)
- PQ is a tangent drawn from an external point P to a circle with centre O , QOR is the diameter of the circle. If $\angle POR=120^\circ$, what is the measure of $\angle OPQ$?
CBSE 2017, Foreign (30/2/1)
- In the given figure PA and PB are tangents to a circle with centre O . If $\angle APB=(2x+3)^\circ$ and $\angle AOB=(3x+7)^\circ$, then find the value of x .
CBSE Sample Paper 2017



- From an external point P , tangents PA and PB are drawn to a circle with centre O . If $\angle PAB=50^\circ$, then find $\angle AOB$. CBSE 2016, Delhi (30/1/1)
- Two circles touch each other externally at P . AB is a common tangent to the circles touching them at A and B . The value of $\angle APB$ is
A) 30° B) 45° C) 60° D) 90° CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
- In a right triangle ABC , right-angled at B , $BC=12$ cm and $AB=5$ cm. The radius of the circle inscribed in the triangle (in cm) is

A) 4

B) 3

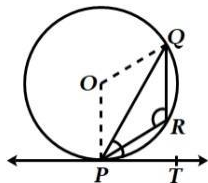
C) 2

D) 1

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

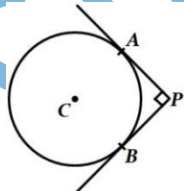
7. In figure, PQ is a chord of a circle with centre O and PT is a tangent. If $\angle QPT = 60^\circ$, find $\angle PRQ$.

CBSE 2015, Outside Delhi (30/1)



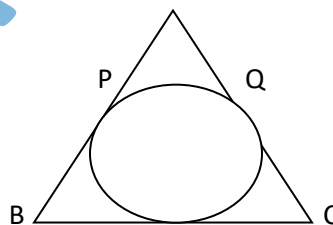
8. In figure, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4 cm . If $PA \perp PB$, then the length of each tangent is:

CBSE 2013, Delhi (30/1/1)

A) 3 cm B) 4 cm C) 5 cm D) 6 cm

9. In figure, the sides AB , and CA of a triangle ABC , touch a circle at P , and R respectively. If $PA = 4\text{ cm}$, $BP = 3\text{ cm}$ and $AC = 11\text{ cm}$, then the length of BC (in cm) is:

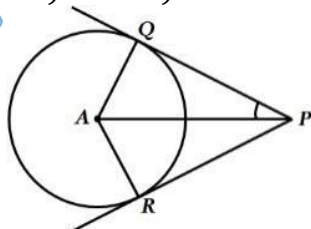
CBSE 2012, Delhi (30/1/1)



10. In figure, PQ and PR are tangents to a circle with centre A . If $\angle QPA = 27^\circ$, then $\angle QAR$ equals.

A) 63° B) 153° C) 126° D) 117°

CBSE 2012, Foreign (30/2/1)



11. In figure, AB and AC are tangents to a circle with centre O and radius 8 cm . If $OA = 17\text{ cm}$, then the length of AC (in cm) is

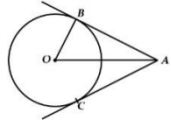
A) $\sqrt{353}$

B) 15

C) 9

D) 25

CBSE 2012, Foreign (30/2/1)

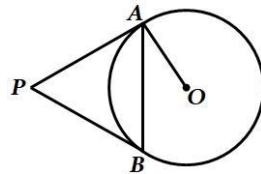


12. From a point Q , 13 cm away from the centre of a circle, the length of tangent PQ to the circle is 12 cm . The radius of the circle (in cm) is.

- A) 25 B) $\sqrt{313}$ C) 5 D) 1 **CBSE 2012, Outside Delhi (30/1)**

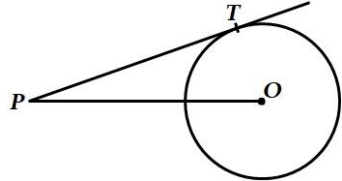
13. In figure, PA and PB are tangents to the circle with centre O . If $\angle APB = 60^\circ$, then $\angle OAB$ is

- A) 30° B) 60° C) 90° D) 15° **CBSE 2011, Delhi (30/1/1)**



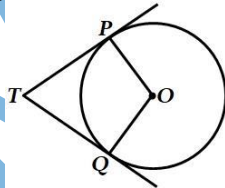
14. In figure, point P is 26 cm away from the centre O of a circle and the length PT of the tangent drawn from P to the circle is 24 cm . Then the radius of the circle is

- A) 25 cm B) 26 cm C) 24 cm D) 10 cm **CBSE 2011, Foreign (30/2/1)**



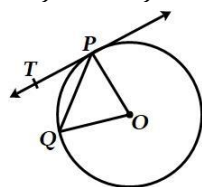
15. In figure, TP and TQ are two tangents to a circle with centre O such that $\angle POQ = 110^\circ$. Then $\angle PTQ$ is equal to

- A) 55° B) 70° C) 110° D) 90° **CBSE 2011, Foreign (30/2/1)**



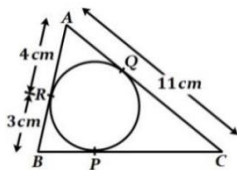
16. In figure, O is the centre of a circle, PQ is a chord and PT is the tangent at P . If $\angle POQ = 70^\circ$, then $\angle TPQ$ is equal to

- A) 55° B) 70° C) 45° D) 35° **CBSE 2011, Outside Delhi (30/1)**

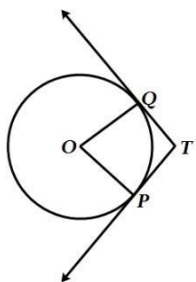


17. In Figure, ΔABC is circumscribing a circle. Find the length of BC .

CBSE 2009, Outside Delhi (30/1)



18. Two tangents TP and TQ are drawn from an external point T to a circle with centre O , as shown in Fig. If they are inclined to each other at an angle of 100° then what is the value of $\angle POQ$?
CBSE Sample Paper III 2008



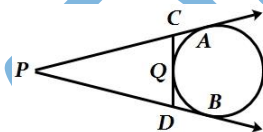
19. What is the distance between two parallel tangents of a circle of the radius 4 cm ?
CBSE Sample Paper II 2008

20. The length of tangent from a point A at a distance of 5 cm from the centre of the circle is 4 cm . What will be the radius of the circle?

CBSE Sample Paper I 2008

21. In the figure given below, PA and PB are tangents to the circle drawn from an external point P . CD is a third tangent touching the circle at Q . If $PB = 10\text{ cm}$, and $CQ = 2\text{ cm}$, what is the length of PC ?

CBSE Sample Paper I 2008



2 Marks:

22. From a point T outside a circle of centre O , tangents TP and TQ are drawn to the circle. Prove that OT is the right bisector of line segment PQ .

CBSE 2015, Delhi (30/1/1)

23. Two concentric circles of radii a and b ($a > b$) are given. Find the length of the chord of the larger circle which touches the smaller circle.

CBSE 2015, Foreign (30/2/1)

24. The incircle of an isosceles triangle ABC , in which $AB = AC$, touches the sides BC , and AB at D , E and F respectively. Prove that $BD = DC$.

CBSE 2014, Foreign (30/2), (30/3)

25. Prove that the parallelogram circumscribing a circle is a rhombus.

CBSE 2013, Delhi (30/1/1)

26. The incircle of an isosceles triangle ABC , with $AB = AC$, touches the sides AB , and CA at D , and F respectively. Prove that E bisects BC .

CBSE 2012, Foreign (30/2/1)

27. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

CBSE 2012, Foreign (30/2/1)

28. Two concentric circles are of radii 7 cm and $r\text{ cm}$ respectively, where $r > 7$. A chord of the larger circle, of length 48 cm , touches the smaller circle. Find the value of r .

CBSE 2011, Delhi (30/1/1)

3 Marks:

1. Prove that the lengths of two tangents drawn from an external point to a circle are equal.

CBSE 2017, Outside Delhi (30/1)

CBSE 2017, Delhi (30/1/1), Foreign (30/2/1)

CBSE 2016, Foreign (30/2/1), Delhi (30/1/1), Outside Delhi (30/1)

2. Prove that a parallelogram circumscribing a circle is a rhombus.

CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)

3. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle. **CBSE 2012, Delhi (30/1/1)**

4. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

5. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

CBSE 2015, Delhi (30/1/1)

6. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

CBSE 2015, Foreign (30/2/1)

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

7. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

CBSE 2013, Delhi (30/1/1)

8. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

CBSE 2012, Delhi (30/1/1)

Unit-5, AREAS RELATED TO CIRCLES

1 Mark:

1. A chord of a circle of radius 10 *cm* subtends a right angle at its centre.

The length of the chord (in *cm*) is

- A) $5\sqrt{2}$
- B) $10\sqrt{2}$
- C) $5\sqrt{3}$
- D) $10\sqrt{3}$

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

2. If the difference between the circumference and the radius of a circle is 37 *cm*, then using $\pi=22/7$, the circumference (in *cm*) of the circle is :

- A) 154
- B) 44
- C) 14
- D) 7

CBSE 2013, Delhi (30/1/1)

3. Two circular pieces of equal radii and maximum area, touching each other are cut out from a rectangular card board of dimensions 14 *cm* \times 7 *cm*. Find the area of the remaining card board.

[Use $\pi=22/7$]

CBSE 2013, Delhi (30/1/1)

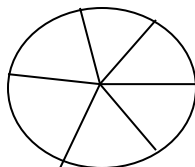
4. If the area of a circle is equal to sum of the areas of two circles of diameters 10 *cm* and 24 *cm*, then the diameter of the larger circle (in *cm*) is:

- A) 34
- B) 26
- C) 17
- D) 14

CBSE 2012, Delhi (30/1/1)

5. In figure, three sectors of a circle of radius 7 *cm*, making angles of $60^\circ, 80^\circ, 40^\circ$ at the centre are shaded. The area of the shaded region (in *cm*²) is [Using $\pi=22/7$]

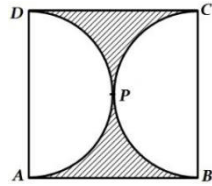
- A) 77
- B) 154
- C) 44
- D) 22



CBSE 2012, Foreign (30/2/1)

6. Find the area of the shaded region in figure, if *ABCD* is a square of side 28 *cm* and *APD* and *BPC* are semicircles.

CBSE 2012, Foreign (30/2/1)



7. The circumference of a circle is 22 cm. The area of its quadrant (in cm^2) is

- A) 772 B) 774 C) 778 D) 7716

CBSE 2012, Outside (30/1)

8. The perimeter (in cm) of a square circumscribing a circle of radius a cm, is

- A) $8a$
B) $4a$
C) $2a$
D) $16a$

CBSE 2011, Outside Delhi (30/1)

9. If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is

- A) 4 units
B) π units
C) 8 units
D) 2 units

CBSE 2011, Foreign (30/2/1)

10. If the diameter of semi-circular protractor is 14 cm, then find its perimeter.

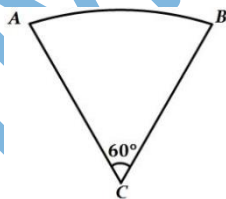
CBSE 2009, Outside Delhi (30/1)

11. What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal?

CBSE Sample Paper II 2008

12. If the adjoining figure is a sector of a circle of radius 10.5 cm, find the perimeter of the sector. (Take $\pi=22/7$)

CBSE Sample Paper II 2008



2 Marks:

1. Find the perimeter of the shaded region if ABCD is a square of side 21 cm and APB & CPD are semicircles. (Use $\pi=22/7$)

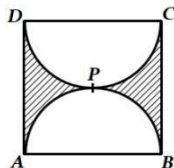
CBSE Sample Paper 2016

2. In figure, ABCD is a square of side 4 cm. A quadrant of a circle of radius 1 cm is drawn at each vertex of the square and a circle of diameter 2 cm is also drawn. Find the area of the shaded region. (Use $\pi=3.14$)

CBSE 2012, Outside Delhi (30/1)

3. From a rectangular sheet of paper $ABCD$ with $AB=40\text{ cm}$ and $AD=28\text{ cm}$, a semi-circular portion with BC as diameter is cut off. Find the area of the remaining paper. (Use $\pi=22/7$)
CBSE 2012, Outside Delhi (30/1)

4. Find the perimeter of the shaded region in figure, if $ABCD$ is a square of side 14 cm and APB and CPD are semicircles. [Use $\pi=22/7$]
CBSE 2011, Outside Delhi (30/1)

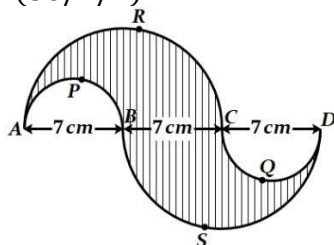


5. The radii of two circles are 4 cm and 3 cm respectively. The diameter of the circle having area equal to the sum of the areas of the two circles (in cm) is

A) 5 B) 7 C) 10 D) 14

CBSE 2011, Delhi (30/1/1)

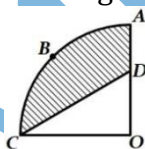
6. In figure, APB and CQD are semi-circles of diameter 7 cm each, while ARC and BSD are semi-circles of diameter 14 cm each. Find the perimeter of the shaded region. [Use $\pi=22/7$]
CBSE 2011, Delhi (30/1/1)



7. Find the area of a quadrant of a circle, where the circumference of circle is 44 cm .
 [Use $\pi=22/7$]

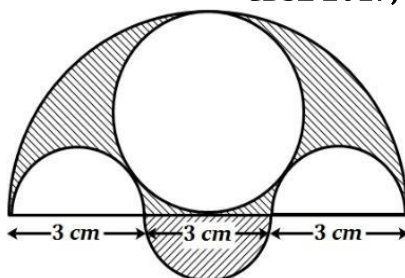
CBSE 2011, Delhi (30/1/1)

8. In figure, $OABC$ is a quadrant of a circle with centre O and radius 3.5 cm . If $OD=2\text{ cm}$, find the area of the shaded region. [Use $\pi=22/7$]
CBSE 2011, Foreign (30/2/1)



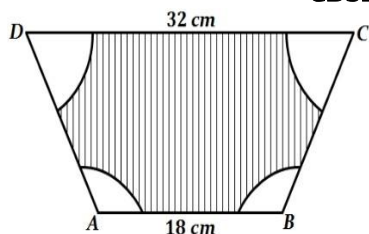
3 Marks:

1. Three semicircles each of diameter 3 cm , a circle of diameter 4.5 cm and a semicircle of radius 4.5 cm are drawn in the given figure. Find the area of the shaded region.
CBSE 2017, Outside Delhi (30/1)



2. In the given figure, $ABCD$ is a trapezium with $AB \parallel DC$, $AB = 18 \text{ cm}$, $DC = 32 \text{ cm}$ and the distance between AB and DC is 14 cm . If arcs of equal radii 7 cm taking A , and D as centres, have been drawn, then find the area of the shaded region.

CBSE 2017, Foreign (30/2/1)

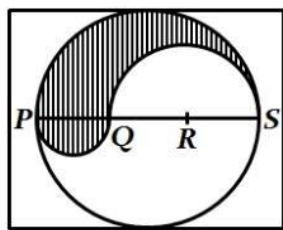


3. Find the area of the minor segment of a circle of radius 42 cm , if the length of the corresponding arc is 44 cm .

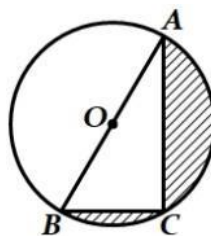
CBSE Sample Paper 2017

4. In given figure, PS is the diameter of a circle of radius 6 cm . The points Q and R trisect the diameter PS . Semi circles are drawn on PQ and QS as diameters. Find the area of the shaded region.

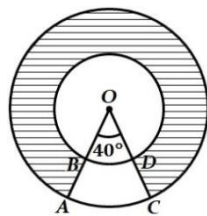
CBSE Sample Paper 2017



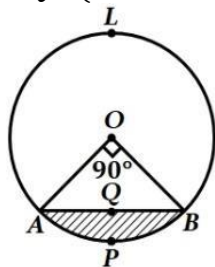
5. In figure, O is the centre of a circle such that diameter $AB = 13 \text{ cm}$ and $AC = 12 \text{ cm}$. BC is joined. Find the area of the shaded region. (Take $\pi = 3.14$) CBSE 2016, Outside Delhi (30/1)



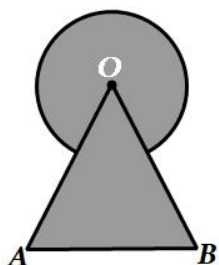
6. In figure, find the area of the shaded region, enclosed between two concentric circles of radii 7 cm and 14 cm where $\angle AOC = 40^\circ$. (Use $\pi = 22/7$) CBSE 2016, Outside Delhi (30/1)



7. In figure, is a chord AB of circle, with centre O and radius 10, that subtends a right angle at the centre of the circle. Find the area of the minor segment $AQBP$. Hence find the area of major segment $ALBQA$. (Use $\pi=3.14$) **CBSE 2016, Foreign (30/2/1)**



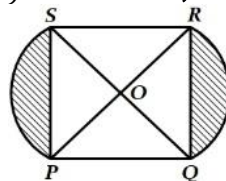
8. Find the area of shaded region shown in the given figure where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre. **CBSE Sample Paper 2016**



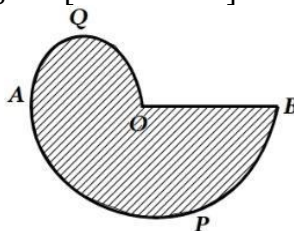
9. Find the area of the minor segment of a circle of radius 14 cm, when its central angle is 60° . Also find the area of the corresponding major segment. [Use $\pi=22/7$]

CBSE 2015, Outside Delhi (30/1)

15. In figure, $PQRS$ is a square lawn with side $PQ=42$ metres. Two circular flower beds are there on the sides PS and QR with centre at O , the intersection of its diagonals. Find the total area of the two flower beds (shaded parts). **CBSE 2015, Outside Delhi (30/1)**

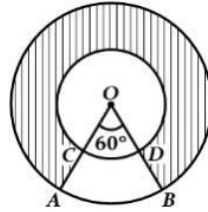


16. In figure, APB and AQO are semicircles, and $AO=OB$. If the perimeter of the figure is 40 cm, find the area of the shaded region. [Use $\pi=22/7$] **CBSE 2015, Delhi (30/1/1)**



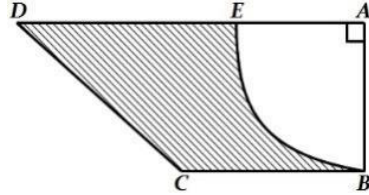
17. In Figure two concentric circles with centre O , have radii 21 cm and 42 cm. If $\angle AOB=60^\circ$, find the area of the shaded region. [Use $\pi=22/7$]

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

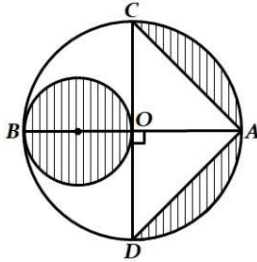


21. In Figure $ABCD$ is a trapezium of area 24.5 sq.cm . In it, $AD \parallel BC$, $\angle DAB = 90^\circ$, $AD = 10 \text{ cm}$ and $BC = 4 \text{ cm}$. If ABE is a quadrant of a circle, find the area of the shaded region. [Take $\pi = 22/7$]

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

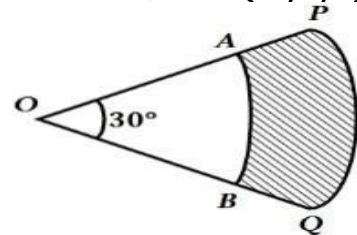


22. If figure, AB and CD are two diameters of a circle with centre O , which are perpendicular to each other. OB is the diameter of the smaller circle. If $OA = 7 \text{ cm}$, find the area of the shaded region. [Use $\pi = 22/7$] CBSE 2013, Delhi (30/1/1)



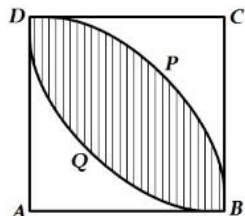
23. In figure, PQ and AB are respectively the arcs of two concentric circles of radii 7 cm and centre O . If $\angle POQ = 30^\circ$, then find the area of the shaded region. [Use $\pi = 22/7$]

CBSE 2012, Delhi (30/1/1)



24. In figure, $ABCD$ is a square of side 7 cm . $DPBA$ and $DQBC$ are quadrants of circles, each of radius 7 cm . Find the area of the shaded region. [Use $\pi = 22/7$]

CBSE 2012, Foreign (30/2/1)



The length of the minute hand of a clock is 14 cm . Find the area swept by the minute hand in 10 minutes.

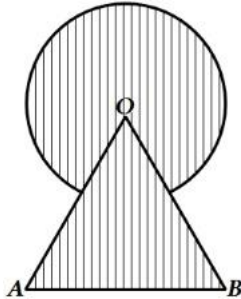
CBSE 2012, Foreign (30/2/1)

30. A chord of a circle of radius 14 cm subtends an angle of 120° at the centre. Find the area of the corresponding minor segment of the circle. [Use $\pi=22/7$ and $\sqrt{3}=1.73$]

CBSE 2011, Outside Delhi (30/1)

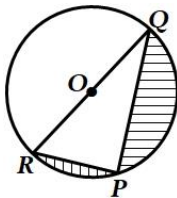
31. Find the area of the shaded region in Figure 3, where a circular arc of radius 7 cm has been drawn with vertex O of an equilateral triangle OAB , of side 12 cm , as centre.

CBSE 2010, Foreign (30/2/1)



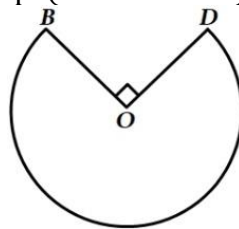
32. In Figure, $PQ=24\text{ cm}$, $OP=7\text{ cm}$ and O is the centre of the circle. Find the area of shaded region (take $\pi=3.14$)

CBSE 2009, Delhi (30/1/1)

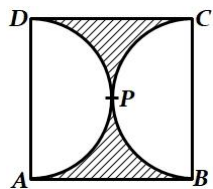


33. In Figure, the shape of the top of a table in a restaurant is that of a sector of a circle with centre O and $\angle BOD=90^\circ$. If $BO=OD=60\text{ cm}$, find
I. the area of the top of the table.

II. The perimeter of the table top. (Take $\pi=3.14$) **CBSE 2009, Foreign (30/2/1)**

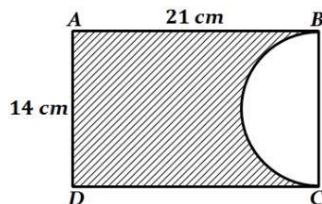


34. In Figure, $ABCD$ is a square of side 14 cm and APD and BPC are semicircles. Find the area of shaded region. (Take $\pi=22/7$) **CBSE 2009, Foreign (30/2/1)**



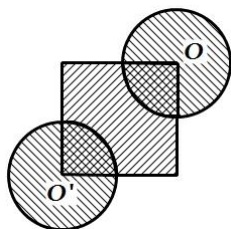
35. In the given figure, $ABCD$ is a rectangle of dimensions $21\text{ cm} \times 14\text{ cm}$. A semicircle is drawn with BC as diameter. Find the area and the perimeter of the shaded region in the figure.

CBSE 2017, Outside Delhi (30/1)



36. A chord PQ of a circle of radius 10 cm subtends an angle of 60° at the centre of circle. Find the area of major and minor segments of the circle. **CBSE 2017, Delhi (30/1/1)**
37. In the given figure, the side of square is 28 cm and radius of each circle is half of the length of the side of the square where O and O' are centres of the circles. Find the area of shaded region.

CBSE 2017, Delhi (30/1/1)

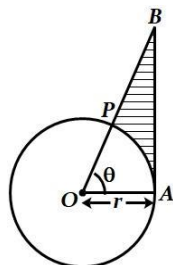


38. A park is of the shape of a circle of diameter 7 m . It is surrounded by a path of width of 0.7 m . Find the expenditure of cementing the path, if its cost ₹ 110 per sq. m .

CBSE 2017, Foreign (30/2/1)

37. In figure, is shown a sector OAP of a circle with centre O , containing $\angle \theta$. AB is perpendicular to the radius OA and meets OP produced at B . Prove that the perimeter of shaded region is $[\tan\theta + \sec\theta + \pi\theta/180 - 1]$

CBSE 2016, Outside Delhi (30/1)



Unit -6 CONSTRUCTIONS

2 Marks:

1. Draw a line segment AB of length 7 cm . Using ruler and compasses, find a point P on AB such that $AP:AB=3:5$.
CBSE 2011, Outside Delhi (30/1)
2. Draw a line segment of length 6 cm . Using compasses and ruler, find a point P on it which divides it in the ratio $3:4$.
CBSE 2011, Delhi (30/1/1)

3 Marks:

1. Draw a triangle ABC in which $AB=5\text{ cm}$, $AC=6\text{ cm}$ and angle $ABC=60^\circ$. Construct a triangle whose sides are 57 times the corresponding sides of triangle ABC .
CBSE Sample Paper II 2016
2. Construct a $\triangle ABC$ in which $AB=6\text{ cm}$, $\angle A=30^\circ$ and $\angle B=60^\circ$. Construct another $\triangle AB'C'$ similar to $\triangle ABC$ with $AB'=8\text{ cm}$.
CBSE 2015, Outside Delhi (30/1)
3. Construct a triangle with sides 5 cm , 5.5 cm and 6.5 cm . Now construct another triangle, whose sides are 35 times the corresponding sides of the given triangle.
CBSE 2014, Outside Delhi (30/1), (30/3)
4. Draw a line segment AB of length 8 cm . Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm . Construct to each circle from the centre of the other circle.
CBSE 2014, Outside Delhi (30/2)
5. Construct a triangle with sides 5 cm , 4 cm and 6 cm . Then construct another triangle whose sides are 23 times the corresponding sides of first triangle.
CBSE 2013, Delhi (30/1/1)
6. Draw a triangle ABC with $BC=7\text{ cm}$, $\angle B=45^\circ$ and $\angle C=60^\circ$. Then construct another triangle, whose sides are 35 times the corresponding sides of $\triangle ABC$.
CBSE 2012, Outside Delhi (30/1)
7. Construct a right triangle in which the sides, (other than the hypotenuse) are of length 6 cm and 8 cm . Then construct another triangle, whose sides are 35 times the corresponding sides of the given triangle.
CBSE 2012, Delhi (30/1/1)
8. Draw a right triangle in which the sides (other than the hypotenuse) are of lengths 6 cm and 8 cm . Then construct another triangle whose sides are 35 times the corresponding sides of the given triangle.
CBSE 2012, Foreign (30/2/1)
9. Draw a triangle ABC in which $AB=5\text{ cm}$, $AC=6\text{ cm}$ and $\angle ABC=60^\circ$. Then construct a triangle whose sides are 57 times the corresponding sides of $\triangle ABC$.
CBSE 2011, Delhi (30/1/1)
10. Draw a pair of tangents to a circle of radius 3 cm , which are inclined to each other at an angle of 60° .
CBSE 2011, Outside Delhi (30/1)
11. Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4 cm and 3 cm . Then construct triangle whose sides are 35 times the corresponding sides of the given triangle.
CBSE 2011, Outside Delhi (30/1)
12. Draw a line segment AB of length 7 cm . Taking A as centre, draw a circle of radius 3 cm and taking B as centre, draw another circle of radius 2 cm . Construct tangents to each circle from the centre of the other circle.
CBSE 2011, Foreign (30/2/1)

13. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then construct another triangle whose sides are 34 times the corresponding sides of the isosceles triangle. **CBSE 2011, Foreign (30/2/1)**

14. Construct a triangle ABC in which $BC=8\text{ cm}$, $\angle B=45^\circ$ and $\angle C=30^\circ$.

Construct another triangle similar to ΔABC such that its sides are 34 of the corresponding sides of ΔABC . **CBSE 2010, Delhi (30/1/1)**

15. Draw a circle of radius 3 cm. From a point P , 7 cm away from the centre of the circle, draw two tangents to the circle. Also, measure the lengths of the tangents.

CBSE 2010, Foreign (30/2/1)

16. Draw a right triangle in which sides (other than hypotenuse) are of lengths 8 cm and 6 cm. Then construct another triangle whose sides are 34 times the corresponding sides of the first triangle. **CBSE 2009, Outside Delhi (30/1)**

17. Construct a ΔABC in which $BC=6.5\text{ cm}$, $AB=4.5\text{ cm}$ and $\angle ABC=60^\circ$. Construct a triangle similar to this triangle whose sides are 34 of the corresponding sides of the triangle ABC . **CBSE 2009, Delhi (30/1/1)**

18. Draw a circle of radius 3 cm. From a point P , 6 cm away from its centre, construct a pair of tangents to the circle. Measure the lengths of the tangents.

CBSE 2009, Foreign (30/2/1)

19. Draw a right triangle in which the sides containing the right angle are 5 cm and 4 cm. Construct a similar triangle whose sides are 53 times the sides of the above triangle.

CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)

20. Construct a ΔABC in which $CA=6\text{ cm}$, $AB=5\text{ cm}$ and $\angle A=45^\circ$, then construct a ΔABC .

CBSE Sample Paper I 2008

21. Construct a triangle similar to given ABC in which $AB=4\text{ cm}$, $BC=6\text{ cm}$ and $\angle ABC=60^\circ$, such that each side of the new triangle is 34 of given ΔABC . **CBSE Sample Paper II 2008**

22. Construct a circle whose radius is equal to 4 cm. Let P be a point whose distance from its centre is 6 cm. Construct two tangents to it from P . **CBSE Sample Paper III 2008**

4 Marks:

1. Construct a triangle ABC with side $BC=7\text{ cm}$, $\angle B=45^\circ$, $\angle A=105^\circ$. Then construct another triangle whose sides are 34 times the corresponding sides of the ΔABC .

CBSE 2017, Outside Delhi (30/1)

2. Construct an isosceles triangle with base 8 cm and altitude 4 cm. Construct another triangle whose sides are 23 times the corresponding sides of the isosceles triangle.

CBSE 2017, Delhi (30/1/1)

3. Draw two concentric circles of radii 3 cm and 5 cm. Taking a point on the outer circle, construct the pair of tangents to the inner circle. **CBSE 2017, Foreign (30/2/1)**

4. Draw a ΔABC with sides $BC=5\text{ cm}$, $AB=6\text{ cm}$ and $AC=7\text{ cm}$ and then construct a triangle similar to ΔABC whose sides are 47 of the corresponding sides of ΔABC .

CBSE Sample Paper 2017

5. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of 60° to each other. **CBSE 2016, Outside Delhi (30/1)**

6. Draw two concentric circles of radii 3 cm and 5 cm. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length. **CBSE 2016, Delhi (30/1/1)**

7. Draw a ΔABC in which $AB=4\text{ cm}$, $BC=5\text{ cm}$ and $AC=6\text{ cm}$. Then construct another triangle whose sides are $\frac{1}{5}$ of the corresponding sides of ΔABC .
CBSE 2016, Foreign (30/2/1)
8. Draw a pair of tangents inclined to each other at an angle of 60° to a circle of radius 3 cm .
CBSE Sample Paper II 2016
9. Construct a triangle ABC with $BC=7\text{ cm}$, $\angle B=60^\circ$ and $AB=6\text{ cm}$. Construct another triangle whose sides are $\frac{1}{4}$ times the corresponding sides of ΔABC .
CBSE 2015, Delhi (30/1/1)
10. Draw a circle of radius 3 cm . From a point P , 7 cm away from its centre draw two tangents to the circle. Measure the length of each tangent. **CBSE 2015, Foreign (30/2/1)**
11. Draw a triangle ABC in which $AB=5\text{ cm}$, $BC=6\text{ cm}$ and $\angle ABC=60^\circ$. Construct another triangle similar to ΔABC with scale factor $\frac{1}{5}$. **CBSE 2015, Sample**

Unit-7, COORDINATE GEOMETRY

1 Mark:

1. If the distance between the points $(4,k)$ and $(1,0)$ is 5 , then what can be the possible values of k ?
CBSE 2017, Delhi (30/1/1)
2. Find the value of a , for which point $(a,3)$ is the midpoint of the line segment joining the points $Q(-5,4)$ and $R(-1,0)$.
CBSE Sample Paper 2016
3. Find the area of a triangle whose vertices are $(3,0)$, $(7,0)$ and $(8,4)$.
CBSE Sample Paper 2015
4. $ABCD$ is a rectangle whose three vertices are $(4,0)$, $C(4,3)$ and $D(0,3)$.
 The length of one of its diagonals is
 A) 5
 B) 4
 C) 3
 D) 25
CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
5. In figure, the area of triangle ABC (in sq. units) is :
 A) 15
 B) 10
 C) 7.5
 D) 2.5
CBSE 2013, Delhi (30/1/1)
6. If the coordinates of one end of a diameter of a circle are $(2,3)$ and the coordinates of its centre are $(-2,5)$, then the coordinates of the other end of the diameter are :
 A) $(-6,7)$
 B) $(6,-7)$
 C) $(6,7)$
 D) $(-6,-7)$
CBSE 2012, Delhi (30/1/1)

7. The coordinates of the point P dividing the line segment joining the points $(1,3)$ and $B(4,6)$ in the ratio $2:1$ are:

- A) $(2,4)$
- B) $(3,5)$
- C) $(4,2)$
- D) $(5,3)$

CBSE 2012, Delhi (30/1/1)

8. The area of a triangle whose vertices are $(5,0)$, $(8,0)$ and $(8,4)$ (in sq. units) is

- A) 20
- B) 12
- C) 6
- D) 16

CBSE 2012, Foreign (30/2/1)

9. If $A(1,3)$, $B(-1,2)$, $C(2,5)$ and $D(x,4)$ are the vertices of a parallelogram $ABCD$, then the value of x is

- A) 3
- B) 4
- C) 0
- D) 32

CBSE 2012, Foreign (30/2/1)

10. The distance of the point $(-3,4)$ from the x -axis is

- A) 3
- B) -3
- C) 4
- D) 5

CBSE 2012, Outside Delhi (30/1)

11. In figure, $(5,-3)$ and $Q(3,y)$ are the points of trisection of the line segment joining $A(7,-2)$ and $B(1,-5)$. Then y equals

- A) 2
- B) 4
- C) -4
- D) -52

CBSE 2012, Outside Delhi (30/1)

12. The point P which divides the line segment joining the points $(2,-5)$ and $B(5,2)$ in the ratio $2:3$ lies in the quadrant 1 Mark

- A) I
- B) II
- C) III
- D) IV

CBSE 2011, Delhi (30/1/1)

13. The mid-point of segment AB is the point $(0,4)$. If the coordinates of B are $(-2,3)$ then the coordinates of A are

- A) $(2,5)$
- B) $(-2,-5)$
- C) $(2,9)$
- D) $(-2,11)$

CBSE 2011, Delhi (30/1/1)

14. The area (in square units) of the triangle formed by the points $(a,0)$, $O(0,0)$ and $B(0,b)$ is

- A) ab
- B) $12ab$
- C) $12a^2b^2$
- D) $12b^2$

CBSE 2011, Foreign (30/2/1)

15. If $(a,2,4)$ is the mid-point of the line-segment joining the points $A(-6,5)$ and $B(-2,3)$, then the value of a is

- A) -8
- B) 3
- C) -4
- D) 4

CBSE 2011, Outside Delhi (30/1)

16. If A and B are the points $(-6,7)$ and $(-1,-5)$ respectively, then the distance $2AB$ is equal to

- A) 13
- B) 26
- C) 169
- D) 238

CBSE 2011, Outside Delhi (30/1)

17. If $(2,p)$ is the mid-point of the line segment joining the points $(6,-5)$ and $B(-2,11)$, find the value of p .

CBSE 2010, Delhi. (30/1/1)

18. If $(1,2)$, $B(4,3)$ and $C(6,6)$ are the three vertices of a parallelogram $ABCD$, find the coordinates of the fourth vertex. D .

CBSE 2010, Delhi (30/1/1)

19. Find the distance between the points, $(2a,6a)$ and $B(2a+\sqrt{3}a,5a)$.

CBSE 2010, Foreign (30/2/1)

20. Find the value of k if $(4,-2)$ is the mid point of the line segment joining the points $A(5k,3)$ and $B(-k,-7)$.

CBSE 2010, Foreign (30/2/1)

21. Find the value of a so that the point $(3,)$ lies on the line represented by $2x-3y=5$.

CBSE 2009, Delhi (30/1/1)

22. Find the distance between the points $(-85,2)$ and $(25,2)$. **CBSE 2009 Delhi (30/1/1)**

23. If the mid-point of the line segment joining the points $(6,-2)$ and $Q(-2,4)$ is $(2,-3)$, find the value of b .

CBSE 2009, Foreign (30/2/1)

2 Marks:

24. If two adjacent vertices of a parallelogram are $(3,2)$ and $(-1,0)$ and the diagonals intersect at $(2,-5)$, then find the coordinates of the other two vertices.

CBSE 2017, Foreign (30/2/1)

25. Find the value of p for which the points $(-1,3)$, $(2,p)$ and $(5,-1)$ are collinear.

CBSE Sample Paper 2017

26. P and Q are the points with coordinates $(2,-1)$ and $(-3,4)$. Find the coordinates of the point R such that PR is $\frac{2}{5}$ of PQ .

CBSE Sample Paper 2017

27. Find the ratio in which the point $(-3, k)$ divides the line-segment joining the points $(-5,-4)$ and $(-2,3)$. Also find the value of k .

CBSE 2016, Foreign (30/2/1)

28. Prove that the points $(2,-2)$, $(-2,1)$ and $(5,2)$ are the vertices of a right angled triangle. Also find the area of this triangle.

CBSE 2016, Foreign (30/2/1)

29. Find the ratio in which y -axis divides the line segment joining the points $(5,-6)$ and $B(-1,-4)$. Also find the coordinates of the point of division.

CBSE 2016, Delhi (30/1/1)

30. The x -coordinates of a point P is twice its y -coordinate. If P is equidistant from $(2,-5)$ and $R(-3,6)$, find the coordinates of P .

CBSE 2016, Delhi (30/1/1)

31. Let P and Q be the points of trisection of the line segment joining the points $(2,-2)$ and $B(-7,4)$ such that P is nearer to A . Find the coordinates of P and Q .

CBSE 2016, Outside Delhi (30/1)

32. Prove that the points $(3,0)$, $(6,4)$ and $(-1,3)$ are the vertices of a right angled isosceles triangle.

CBSE 2016, Outside Delhi (30/1)

33. Find a relation between x & y such that the point (x, y) is equidistant from the points $(-5,3)$ and $B(7,2)$.

CBSE Sample Paper 2016

34. If $(5,2)$, $B(2,-2)$ and $C(-2,t)$ are the vertices of a right angled triangle with $\angle B = 90^\circ$, then find the value of t .

CBSE 2015, Delhi (30/1/1)

35. Find the ratio in which the point $(34, 512)$ divides the line segment joining the points $A(12, 32)$ and $B(2, -5)$.

CBSE 2015, Delhi (30/1/1)

36. Show that the points (a, a) , $(-a, -a)$ and $(-\sqrt{3}a, \sqrt{3}a)$ are the vertices of an equilateral triangle.

CBSE 2015, Foreign (30/2/1)

37. For what value of k are the points $(8,1)$, $(3,-2k)$ and $(k,-5)$ collinear?

CBSE 2015, Foreign (30/2/1)

38. The points $(4,7)$, $B(p,3)$ and $C(7,3)$ are the vertices of a right triangle, right-angled at B . Find the value of p .

CBSE 2015, Outside Delhi (30/1)

39. Find the relation between x and y if the points (x, y) , $(-5,7)$ and $C(-4,5)$ are collinear.

CBSE 2015, Outside Delhi (30/1)

40. If a point $(0,2)$ is equidistant from the points $B(3,p)$ and $C(p,5)$, then find the value of p .

CBSE 2012, Delhi (30/1/1)

41. Find the ratio in which the line segment joining the points $(1,-3)$ and $(4,5)$ is divided by x -axis.

CBSE 2012, Foreign (30/2/1)

42. Find the value of k , if the point $(2,4)$ is equidistant from the points $A(5,k)$ and $B(k,7)$.

CBSE 2012, Outside Delhi (30/1)

43. Find the value(s) of x for which the distance between the points $(x,4)$ and $Q(9,10)$ is 10 units.

CBSE 2011, Delhi (30/1/1)

44. Find the relation between x and y such that point (x, y) is equidistant from the points $(1,4)$ and $B(-1,2)$.

CBSE 2011, Foreign (30/2/1)

45. Find the value of y for which the distance between the points $(3, -1)$ and $B(11, y)$ is 10 units. **CBSE 2011, Outside Delhi (30/1)**
46. Show that the points $(-2, 5)$; $(3, -4)$ and $(7, 10)$ are the vertices of a right angled isosceles triangle. **CBSE 2009, Foreign (30/2/1)**
47. The centre of a circle is $(2\alpha - 1, 7)$ and it passes through the point $(-3, -1)$. If the diameter of the circle is 20 units, then find the value(s) of α . **CBSE 2009, Foreign (30/2/1)**
48. If C is a point lying on the line segment AB joining $(1, 1)$ and $B(2, -3)$ such that $3 AC = CB$, then find the coordinates of C . **CBSE 2009, Foreign (30/2/1)**
49. If the points $(4, 3)$ and $B(x, 5)$ are on the circle with the centre $O(2, 3)$, find the value of x . **CBSE 2009, Outside Delhi (30/1)**
50. Find the value of k if the points $(k, 3)$, $(6, -2)$ and $(-3, 4)$ are collinear. **CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)**
51. The coordinates of the vertices of $\triangle ABC$ are $(4, 1)$, $B(-3, 2)$ and $C(0, k)$ given that the area of ABC is 12 unit², find the value of k . **CBSE Sample Paper III 2008**
52. Find the values of x for which the distance between the point $(2, -3)$ and $Q(x, 5)$ is 10 units. **CBSE Sample Paper II 2008**
53. Find a point on the y -axis which is equidistant from the points $(6, 5)$ and $B(-4, 3)$. **CBSE Sample Paper I 2008**

3 Marks:

54. The vertices of a triangle are $(-1,3)$, $B(1,-1)$ and $C(5,1)$. Find the length of the median through the vertex C .
CBSE Sample Paper 2017
55. Find the coordinates of the points of trisection of the line segment joining the points $(3,-2)$ and $(-3,-4)$.
CBSE 2017, Foreign (30/2/1)
56. In the given figure, ΔABC is an equilateral triangle of side 3 units. Find the coordinates of the other two vertices.
CBSE 2017, Foreign (30/2/1)
57. Show that ΔABC with vertices $A(-2,0)$, $B(0,2)$ and $C(2,0)$ is similar to ΔDEF with vertices $D(-4,0)$, $F(4,0)$ and $E(0,4)$.
CBSE 2017 (30/2/1), (30/1/1)
58. The area of a triangle is 5 sq units. Two of its vertices are $(2,1)$ and $(3,-2)$. If the third vertex is $(7,2)$, find the value of y .
CBSE 2017, Delhi (30/1/1)
59. If the point $(-1,2)$ divides internally the line-segment joining the points $A(2,5)$ and $B(x,y)$ in the ratio $3:4$, find the value of x^2+y^2 .
CBSE 2016, Foreign (30/2/1)
60. In figure, ABC is a triangle coordinates of whose vertex A are $(0,-1)$. D and E respectively are the mid-points of the sides AB and AC and their coordinates are $(1,0)$ and $(0,1)$ respectively. If F is the mid-point of BC , find the areas of ΔABC and ΔDEF .
CBSE 2016, Delhi (30/1/1)
61. If the point (x,y) is equidistant from the points $(a+b,-a)$ and $B(a-b,a+b)$. Prove that $bx=ay$.
CBSE 2016, Outside Delhi (30/1)
62. Find the area of the triangle ABC with $(1,-4)$ and mid-points of sides through A being $(2,-1)$ and $(0,-1)$.
CBSE 2015, Delhi (30/1/1)
63. Point A lies on the line segment PQ joining $P(6,-6)$ and $Q(-4,-1)$ in such a way that $PAPQ=25$. If point P also lies on the line $3x+(y+1)=0$, find the value of k .
CBSE 2015, Foreign (30/2/1)
64. If the coordinates of points A and B are $(-2,-2)$ and $(2,-4)$ respectively, find the coordinates of P such that $AP=37AB$, where P lies on the line segment AB .
CBSE 2015, Outside Delhi (30/1)
65. If the point $(k-1,2)$ is equidistant from the points $A(3,k)$ and $B(k,5)$, find the values of k .
CBSE 2014, Outside Delhi (30/1)
66. Find the ratio in which the line segment joining the points $(3,-3)$ and $B(-2,7)$ is divided by x -axis. Also find the coordinates of the point of division.
CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
67. Prove that the diagonals of a rectangle $ABCD$, with vertices $A(2,-1)$, $B(5,-1)$, $C(5,6)$ and $D(2,6)$, are equal and bisect each other.
CBSE 2014, Foreign (30/2)

68. Find a point P on the y -axis which is equidistant from the points $(4,8)$ and $B(-6,6)$. Also find the distance. AP . **CBSE 2014, Foreign (30/3)**
69. A point P divides the line segment joining the points $(3,-5)$ and $B(-4,8)$ such that $APPB=K1$. If P lies on the line $x+y=0$, then find the value of K .
CBSE 2012, Delhi (30/1/1)
70. If the vertices of a triangle are $(1,-3), (4,p)$ and $(-9,7)$ and its area is 15 sq. Units, find the value(s) of p .
CBSE 2012, Delhi (30/1/1)
71. If $(3,3), (6,y), (x,7)$ and $(5,6)$ are the vertices of a parallelogram taken in order, find the values of x and y .
CBSE 2011, Delhi (30/1/1)
72. If two vertices of an equilateral triangle are $(3,0)$ and $(6,0)$, find the third vertex.
CBSE 2011, Delhi (30/1/1)
73. Find the value of k , if the points $(5,4), Q(7,k)$ and $R(9,-2)$ are collinear.
CBSE 2011, Delhi (30/1/1)
74. Find the area of the quadrilateral $ABCD$ whose vertices are $A(3,-1), B(9,-5), C(14,0)$ and $D(9,19)$.
CBSE 2011, Foreign (30/2/1)
75. Find the coordinates of the points which divide the line segment joining $(2,-3)$ and $B(-4,-6)$ into three equal parts.
CBSE 2011, Foreign (30/2/1)
76. Show that the points $A(3,5), B(6,0), C(1,-3)$ and $D(-2,2)$ are the vertices of a square $ABCD$.
CBSE 2011, Foreign (30/2/1)
77. Find a relation between x and y if the points $(x,); (1,2)$ and $(7,0)$ are collinear.
CBSE 2009, Foreign (30/2/1)
78. Find the ratio in which the line segment joining the points $(3,-6)$ and $B(5,3)$ is divided by x -axis. Also find the coordinates of the point of intersection.
CBSE Sample Paper III 2008
79. Find the relation between x and y such that the point $(x,)$ is equidistant from the points $(2,5)$ and $B(-3,7)$
CBSE Sample Paper III 2008
80. Prove that the points $(-3,0), B(1,-3)$ and $C(4,1)$ are the vertices of an isosceles right triangle.
CBSE Sample Paper II 2008
81. For what value of ' k ' the points $(1,5), B(k,1)$ and $C(4,11)$ are collinear?
CBSE Sample Paper II 2008
82. In what ratio does the point $(2,-5)$ divide the line segment joining $A(-3,5)$ and $B(4,-9)$?
CBSE Sample Paper II 2008
83. Observe the graph given below and state whether triangle ABC is scalene, isosceles or equilateral. Justify your answer. Also find its area. **CBSE Sample Paper I 2008**
84. Find the area of the quadrilateral whose vertices taken in order are $(-5,-3)$ $B(-4,-6), C(2,-1)$ and $D(1,2)$.
CBSE Sample Paper I 2008
85. Prove that the points $(7,10), (-2,5)$ and $(3,-4)$ are the vertices of an isosceles right triangle.
CBSE 2013, Delhi (30/1/1)
86. Find the ratio in which the y -axis divides the line segment joining the points $(-4,-6)$ and $(10,12)$. Also, find the coordinates of the point of division.
CBSE 2013, Delhi (30/1/1)

87. For what type of k , ($k > 0$), is the area of the triangle with vertices $(-2, 5)$, $(k, -4)$ and $(2k+1, 10)$ to 53 sq. units? **CBSE 2012, Foreign (30/2/1)**
88. Find the ratio in which the y -axis divides the line segment joining the points $(5, -6)$ and $(-1, -4)$. Also, find the coordinates of the point of intersection. **CBSE 2012, Foreign (30/2/1)**
89. Find the coordinates of a point P , which lies on the line segment joining the point $A(-2, -2)$ and $B(2, -4)$ such that $AP = 3AB$. **CBSE 2012, Outside Delhi (30/1)**
90. Find the area of the quadrilateral $ABCD$ whose vertices are $A(-3, -1)$, $B(-2, -4)$, $C(4, -1)$ and $D(3, 4)$. **CBSE 2012, Outside Delhi (30/1)**
91. If the points $(x,)$, $(3, 6)$ and $C(-3, 4)$ are collinear show that $x - 3y + 15 = 0$. **CBSE 2012, Outside Delhi (30/1)**
92. Point $(x, 4)$ lies on the line segment joining the points $A(-5, 8)$ and $B(4, -10)$. Find the ratio in which point P divides the line segment AB . Also, find the value of x . **CBSE 2011, Outside Delhi (30/1)**
93. Find the area of the quadrilateral $ABCD$, whose vertices are $A(-3, -1)$, $B(-2, -4)$, $C(4, -1)$ and $D(3, 4)$. **CBSE 2011, Outside Delhi (30/1)**
94. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(2, 1)$, $B(4, 3)$ and $C(2, 5)$. **CBSE 2011, Outside Delhi (30/1)**
95. Point P divides the line segment joining the points $(2, 1)$ and $B(5, -8)$ such that $ABAP = 13$. If P lies on the line $2x - y + k = 0$, find the value of k . **CBSE 2010, Delhi (30/1/1)**
96. If $(x,)$ is a point on the line segment joining the points $(a,)$ and (b, a) , then prove that $x + y = a + b$. **CBSE 2010, Delhi (30/1/1)**
97. If point $(12,)$ lies on the line segment joining the points $(3, -5)$ and $B(-7, 9)$, then find the ratio in which P divides AB . Also find the value of y . **CBSE 2010, Foreign (30/2/1)**
98. Find the value of k for which the point $(9,)$, $(4, -2)$ and $C(3, -3)$ are collinear. **CBSE 2010, Foreign (30/2/1)**
99. Find the point on y -axis which is equidistant from the points $(5, -2)$ and $(-3, 2)$. **CBSE 2009, Delhi (30/1/1)**
100. The line segment joining the points $(2, 1)$ and $B(5, -8)$ is trisected at the point P and Q such that P is nearer to A . If P also lies on the line given by $2x - y + k = 0$, find the value of k . **CBSE 2009, Delhi (30/1/1)**
101. If $(x,)$ is any point on the line joining the points $(a, 0)$ and $B(0, b)$, then show that $xa + yb = 1$. **CBSE 2009, Delhi (30/1/1)**
102. Find the ratio in which the point $(2,)$ divides the line segment joining the points $(-2, 2)$ and $B(3, 7)$. Also find the value of y . **CBSE 2009, Outside Delhi (30/1)**
103. Find the area of the quadrilateral $ABCD$ whose vertices are $A(-4, -2)$, $B(-3, -5)$, $C(3, -2)$ and $D(2, 3)$. **CBSE 2009, Outside Delhi (30/1)**
104. If P divides the join of $(-2, -2)$ and $B(2, -4)$ such that $APAB = 37$, find the coordinates of P . **CBSE 2008, Foreign (30/2/1)**
105. The mid-points of the sides of triangle are $(3, 4)$, $(4, 6)$ and $(5, 7)$. Find the coordinates of the vertices of the triangle. **CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)**
106. Show that $A(-3, 2)$, $B(-5, -5)$, $C(2, -3)$ and $D(4, 4)$ are the vertices of a rhombus. **CBSE 2008, Foreign (30/2/2)**

107. Find the ratio in which the line $3x+y-9=0$ divides the line-segment joining the points (1,3) and (2,7)

CBSE 2008, Foreign (30/2/3)

Unit-8, REAL NUMBERS

1 Mark:

1. Write whether the rational number 511500 will have a terminating decimal expansion or a non-terminating repeating decimal expansion.
2. Find the $[HCF \times LCM]$ for the numbers 100 and 190.
3. The decimal expansion of the rational number 4324.53, will terminate after how many placed of decimals?
4. Has the rational number 44122.57.72 a terminating or a non-terminating decimal representation?
5. Express the numbers in its product of prime factors: 120, 140, 210, ect.

2 or 3 Marks:

1. Prove that $3+\sqrt{2}$ is an irrational number.
2. Prove that $\sqrt{5}$ is an irrational number.
3. Use Euclid's Division Lemma to show that the square of any positive integer is either of the form $3m$ or $(3m+1)$ for some integer m .
4. Show that the square of any positive odd integer is of the form $8m+1$, for some integer m .
5. Prove that $7+3\sqrt{2}$ is not a rational number.
6. Prove that $2-3\sqrt{5}$ is an irrational number.

Unit-9, POLYNOMIALS

1 Mark:

1. The roots of the equation $x^2+x-(p+1)=0$, where p is a constant, are
A) $p,+1$
B) $-p,+1$
C) $p,-(p+1)$
D) $-p,-(p+1)$

CBSE 2011, Delhi (30/1/1)

2. If α , are the zeroes of a polynomial, such that $\alpha+\beta=6$ and $\alpha\beta=4$, then write the polynomial.
CBSE 2010, Delhi (30/1/1)
3. If one zero of the polynomial x^2-4x+1 is $2+\sqrt{3}$, write the other zero.

CBSE 2010, Foreign (30/2/1)

4. For what value of k , (-4) is a zero of the polynomial $x^2 - x - (2k+2)$?

CBSE 2009, Delhi (30/1/1)

5. Write the polynomial, the product and sum of whose zeroes are -92 and -32 respectively.

CBSE 2009, Foreign (30/2/1)

6. If 1 is a zero of the polynomial $(x) = ax^2 - 3(a-1)x - 1$, then find the value of a .

CBSE 2009, Outside Delhi (30/1)

7. Show that $x = -3$ is a solution of $x^2 + 6x + 9 = 0$.

CBSE 2008, Foreign (30/2/1)

8. Show that $x = -3$ is a solution of $2x^2 + 5x - 3 = 0$.

CBSE 2008, Foreign (30/2/2)

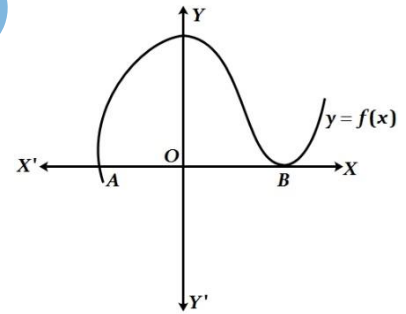
9. If $(x+a)$ is a factor of $2x^2 + 2ax + 5x + 10$, find a .

CBSE 2008, Foreign (30/2/2)

10. The sum and product of the zeroes of a quadratic polynomial are $-1/2$ and -3 respectively. What is the quadratic polynomial?

CBSE Sample Paper I 2008

11. The graph of $y = f(x)$ is given below. Find the number of zeroes of $f(x)$.

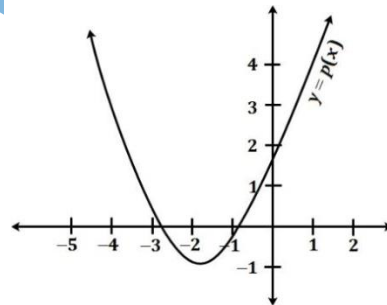


CBSE Sample Paper II 2008

12. Give an example of polynomials $f(x)$, $g(x)$, $q(x)$ and $r(x)$ satisfying $f(x) = g(x) \cdot q(x) + r(x)$ where $\deg(r(x)) = 0$.

CBSE Sample Paper II 2008

13. In Fig. the graph of polynomial $p(x)$ is given. Find the zeroes of the polynomial.



CBSE Sample Paper III 2008

2 Marks:

1. If two zeroes of the polynomial $x^3 - 4x^2 - 3x + 12$ are $\sqrt{3}$ and $-\sqrt{3}$, then find its third zero.

CBSE 2010, Delhi (30/1/1)

2. If -1 and 2 are two zeroes of the polynomial $2x^3 - x^2 - 5x - 2$, find its third zero.

CBSE 2010, Foreign (30/2/1)

3. If the polynomial $6x^4+8x^3+17x^2+21x+7$ is divided by another polynomial $3x^2+4x+1$, the remainder comes out to be $(ax+b)$, find a and b .

CBSE 2009, Delhi (30/1/1)

4. Find all the zeroes of the polynomial x^3+3x^2-2x-6 , if two of its zeroes are $-\sqrt{2}$ and $\sqrt{2}$.

CBSE 2009, Outside Delhi (30/1)

5. Find all the zeroes of the polynomial $x^4+x^3-34x^2-4x+120$, if two its zeroes are 2 and -2.

CBSE 2008, Foreign (30/2/2)

6. Write a quadratic polynomial, sum of whose zeroes is $2\sqrt{3}$ and their product is 2.

CBSE Sample Paper III 2008

7. What are the quotient and the remainder, when $3x^4+5x^3-7x^2+2x+2$ is divided by x^2+3x+1 ?

CBSE Sample Paper III 2008

3 Marks:

1. If the polynomial $6x^4+8x^3-5x^2+ax+b$ is exactly divisible by the polynomial $2x^2-5$, then find the value of a and b .

CBSE 2009, Foreign (30/2/1)

2. If two zeroes of polynomial $x^4+3x^3-20x^2-6x+36$ are $\sqrt{2}$ and $-\sqrt{2}$, find the other zeroes of the polynomial.

CBSE 2007, Outside Delhi (30/1)

3. Find the zeroes of the quadratic polynomial x^2+5x+6 and verify the relationship between the zeroes and the coefficients.

CBSE Sample Paper II 2008

4. Find all the zeroes of the polynomial $3x^4+6x^3-2x^2-10x-5$ if two of its zeroes are $\sqrt{53}$ and $-\sqrt{53}$.

CBSE Sample paper I 2017-2018

Unit-10. QUADRATIC EQUATIONS

1 Mark:

1. If one root of the quadratic equation $6x^2-x-k=0$ is 23, then find the value of k .

CBSE 2017, Foreign (30/2/1)

2. Find the value of k , for which one root of the quadratic equation $kx^2-14x+8=0$ is six times the other.

CBSE Sample Paper 2016

3. If $x=-12$, is a solution of the quadratic equation $3x^2+2kx-3=0$, find the value of k .

CBSE 2015, Delhi (30/1/1)

4. If the quadratic equation $px^2-2\sqrt{5} px+15=0$ has two equal roots, then find the value of p .

CBSE 2015, Outside Delhi (30/1)

5. If 1 is a root of the equations $ay^2+ay+3=0$ and $y^2+y+b=0$, then ab equals:

A) 3

B) -72

- C) 6
D) -3

CBSE 2012, Delhi (30/1/1)

6. If the quadratic equation $mx^2+2x+m=0$ has two equal roots, then the values of m are

- A) ± 1
B) 0,2
C) 0,1
D) -1,0

CBSE 2012, Foreign (30/2/1)

7. The roots of the quadratic equation $2x^2-x-6=0$ are

- A) $-2, 3/2$
B) $2, -3/2$
C) $-2, -3/2$
D) $2, 3/2$

CBSE 2012, Outside Delhi (30/1)

8. The roots of the equation $x^2+x-(p+1)=0$, where p is a constant, are

- A) $p, +1$
B) $-p, +1$
C) $p, -(p+1)$
D) $-p, -(p+1)$

CBSE 2011, Delhi (30/1/1)

9. The roots of the quadratic equation $x^2+5x-(\alpha+1)(\alpha+6)=0$, where α is a constant, are

- A) $\alpha+1, +6$
B) $(\alpha+1), -(\alpha+6)$
C) $-(\alpha+1), (\alpha+6)$
D) $-(\alpha+1), -(\alpha+6)$

CBSE 2011, Foreign (30/2/1)

10. The roots of the equation $x^2-3x-(m+3)=0$, where m is a constant, are

- A) $m, +3$
B) $-m, +3$
C) $m, -(m+3)$
D) $-m, -(m+3)$

CBSE 2011, Outside Delhi (30/1)

11. Find the discriminant of the quadratic equation

$$3\sqrt{3}x^2+10x+\sqrt{3}=0.$$

CBSE 2009, Outside Delhi (30/1)

12. Write the nature of roots of quadratic equation $4x^2+4\sqrt{3}x+3=0$.

CBSE 2009, Foreign (30/2/1)

13. For what value of k the quadratic equation $x^2-kx+4=0$ has equal roots?

CBSE Sample Paper I 2008

14. What is the nature of roots of the quadratic equation $4x^2-12x-9=0$?

CBSE Sample Paper II 2008

2 Marks:

1. Find the value of p , for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.
CBSE 2017, Outside Delhi (30/1)
2. Find the roots of the quadratic equation $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$. CBSE 2017, Delhi (30/1/1)
3. Find the value of k for which the equation $x^2 + (2x + k - 1) + 2 = 0$ has real and equal roots.
CBSE 2017, Delhi (30/1/1)
4. Solve for x :
 $\sqrt{3}x^2 + 10x - 8\sqrt{3} = 0$. CBSE 2017, Foreign (30/2/1)
5. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $(x^2 + x) + k = 0$ has equal roots, find the value of k . CBSE 2016, Outside Delhi (30/1)
6. If $x = 23$ and $x = -3$ are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b .
CBSE 2016, Delhi (30/1/1)
7. A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number.
CBSE 2016, Foreign (30/2/1)
8. If 2 is a root of the equation $x^2 + kx + 12 = 0$ and the equation $x^2 + kx + q = 0$ has equal roots, find the value of q .
CBSE Sample Paper 2016
9. Solve the following quadratic equation for x :
 $4x^2 - 4a^2x + (a^4 - b^4) = 0$ CBSE 2015, Delhi (30/1/1)
10. Solve for x :
 $x^2 - (\sqrt{3} + 1)x + \sqrt{3} = 0$ CBSE 2015, Foreign (30/2/1)
11. Solve the following quadratic equation for x :
 $4x^2 + 4bx - (a^2 - b^2) = 0$ CBSE 2015, Outside (30/1)
12. Find the roots of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$. CBSE Sample Paper 2015
13. Find the values of p for which the quadratic equation $4x^2 + px + 3 = 0$ has equal roots.
CBSE 2014, (30/1), (30/3)
14. Find the values of k for which the quadratic equation $9x^2 - 3kx + k = 0$ has equal roots.
CBSE 2014 (30/2), (30/3)
15. Solve the following quadratic equation for x :
 $4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$ CBSE 2013, Delhi (30/1/1)
16. Find the value(s) of k so that the quadratic equation $x^2 - 4kx + k = 0$ has equal roots.
CBSE 2012, Delhi (30/1/1)
17. Find the value of k for which the roots of the quadratic equation $(k - 4)^2 + 2(k - 4) + 2 = 0$ are equal.
CBSE 2012, Foreign (30/2/1)
18. Find the value of p for which the roots of the equation $(x - 2) + 6 = 0$, are equal.
CBSE 2012, Outside Delhi (30/1)
19. Find the value of p so that the quadratic equation $(x - 3) + 9 = 0$ has two equal roots.
CBSE 2011, Delhi (30/1/1)
20. For what value of k does the quadratic equation $(k - 5)^2 + 2(k - 5) + 2 = 0$ have equal roots?
CBSE 2011, Foreign (30/2/1)
21. Find the roots of the following quadratic equation:
 $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$ CBSE 2011, Foreign (30/2/1)
22. Find the value of m so that the quadratic equation $(x - 7) + 49 = 0$ has two equal roots.

CBSE 2011, Outside Delhi (30/1)

23. Find the roots of the following quadratic equation :

$$2\sqrt{3}x^2 - 5x + \sqrt{3} = 0$$

CBSE 2011, Delhi (30/1/1)

24. Find the roots of the following quadratic equation:

$$x^2 - 3\sqrt{5}x + 10 = 0$$

CBSE 2011, Outside Delhi (30/1)

3 Marks:

1. Speed of a boat in still water is 15 km/h . It goes 30 km upstream and returns back at the same point in 4 hours 30 minutes. Find the speed of the stream.

CBSE 2017, Delhi (30/1/1)

2. Solve for x :

$$1x + 1 + 35x + 1 = 5x + 4, \neq -1, -15, -4$$

CBSE 2017, Outside Delhi (30/1)

3. A motor boat whose speed is 24 km/h in still water takes 1 hours more to go 32 km upstream than to return downstream to the same spot. Find the speed of the stream.

CBSE 2016, Outside Delhi (30/1)

4. A pole has to be erected at a point on the boundary of a circular park of diameter 17 m in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres . Find the distances from the two gates where the pole is to be erected.

CBSE 2016, Foreign (30/2/1)

5. Find the positive value(s) of k for which quadratic equations $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ both will have real roots.

CBSE 2016, Foreign (30/2/1)

6. Three eighth of the students of a class opted for visiting an old age home. Sixteen students opted for having a nature walk. Square root of total number of students in the class opted for tree plantation in the school. The number of students who visited an old age home is same as the number of students who went for a nature walk and did tree plantation. Find the total number of student. What values are inculcated in students through such activities?

CBSE Sample Paper 2016

7. A passenger, while boarding the plane, slipped from the stairs and got hurt. The pilot took the passenger in the emergency clinic at the airport for treatment. Due to this, the plane got delayed by half an hour. To reach the destination 1500 km away in time, so that the passengers could catch the connecting flight, the speed of the plane was increased by 250 km/hour than the usual speed. Find the usual speed of the plane.

What value is depicted in this question?

CBSE 2016, Delhi (30/1/1)

8. Find x in terms of a , and c :

$$ax - a + bx - b = 2cx - c, \neq a, b, c$$

CBSE 2016, Delhi (30/1/1)

9. The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then the sum of the new fraction and original fraction is 2920. Find the original fraction.

CBSE 2015, Delhi (30/1/1)

10. Solve for x :

$$2x + 1 + 32(x - 2) = 235x, x \neq 0, -1, 2$$

CBSE 2015, Delhi (30/1/1)

11. If $x = -2$ is a root of the equation $3x^2 + 7x + p = 0$, find the values of k so that the roots of the equation $x^2 + (4x + k - 1) + p = 0$ are equal.

CBSE 2015, Foreign (30/2/1)

12. The total cost of a certain length of a piece of cloth is ₹ 200. If the piece was 5 m longer and each metre of cloths costs ₹ 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre?
CBSE 2015, Foreign (30/2/1)
13. A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what is its first speed?
CBSE 2015, Outside Delhi (30/1)
14. Anil takes 6 days less than the time taken by Varun to finish a piece of work. If both Anil and Varun together can finish that work in 4 days, find the time taken by Varun to finish the work independently.
CBSE Sample Paper 2015
15. A train, travelling at a uniform speed for 360 km would have taken 48 minutes less to travel the same distance, if its speed were 5 km/h more. Find the original speed of the train.
CBSE Sample Paper 2015
16. Solve for x :
 $x - 2x - 3 + x - 4x - 5 = 103$; ≠ 3, 5
CBSE 2014, Outside Delhi (30/1)
17. A motorboat whose speed in still water is 18 km/h, takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.
CBSE 2014, (30/1), (30/2), (30/3)
18. Solve for x :
 $x - 3x - 4 + x - 5x - 6 = 103$; ≠ 4, 6
CBSE 2014, Foreign (30/2/1)
19. Solve the following for x :
 $12a + b + 2x = 12a + 1b + 12x$
CBSE 2013, Delhi (30/1/1)
20. Sum of the areas of two squares is 400 cm². If the difference of their perimeters is 16 cm, find the sides of the two squares.
CBSE 2013, Delhi (30/1/1)
21. A shopkeeper buys some books for ₹ 80. If he had bought 4 more books for the same amount, each book would have cost ₹ 1 less. Find the number of books he bought.
CBSE 2012, Delhi (30/1/1)
22. The sum of two numbers is 9 and the sum of their reciprocals is 12. Find the numbers.
CBSE 2012, Delhi (30/1/1)
23. A two-digit number is such that the product of its digits is 14. When 45 is added to the number, the digits interchange their places. Find the number.
CBSE 2012, Foreign (30/2/1)
24. Find the consecutive natural numbers, the sum of whose squares is 145.
CBSE 2012, Foreign (30/2/1)
25. The numerator of a fraction is 3 less than its denominator. If 1 is added to the denominator, the fraction is decreased by $\frac{1}{115}$. Find the fraction.
CBSE 2012, Outside Delhi (30/1)
26. In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and time increased by 30 minutes. Find the original duration of the flight.
CBSE 2012, Outside Delhi (30/1)
27. A motor boat whose speed is 20 km/h in still water, takes 1 hour more to go 48 km upstream than to return downstream to the same spot. Find the speed of the stream.
CBSE 2011, Delhi (30/1/1)

28. Find the roots of the equation $1x+4-1x-7=1130, \neq -4, 7$ CBSE 2011, Delhi (30/1/1)
29. Two water taps together can fill a tank in 6 hours. The tap of larger diameter takes 9 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank. CBSE 2011, Foreign (30/2/1)
30. Solve the following equation for x :
 $1x+1+2x+2=5x+4, \neq -1, -2, -4$ CBSE 2011, Foreign (30/2/1)
31. A train travels 180 km at a uniform speed. If the speed had been 9 km/hour more, it would have taken 1 hour less for same journey. Find the speed of the train. CBSE 2011, Outside Delhi (30/1)
32. Find the roots of the equation $12x-3+1x-5=1, \neq 32, 5$. CBSE 2011, Outside Delhi (30/1)

Unit -11, INTRODUCTION TO TRIGONOMETRY

1 Mark:

1. If $3x = \operatorname{cosec} \theta$ and $3x = \cot \theta$, find the value of $3(x^2 - 1x^2)$. CBSE 2010, Delhi (30/1/1)
2. If $6x = \sec \theta$ and $6x = \tan \theta$, find the value of $9(x^2 - 1x^2)$. CBSE 2010, Foreign (30/2/1)
3. If $\sec^2(1 + \sin \theta)(1 - \sin \theta) = k$, then find the value of k . CBSE 2009, Outside Delhi (30/1)
4. If $\sin \theta = 13$, then find the value of $(2 \cot^2 \theta + 2)$. CBSE 2009, Delhi (30/1/1)
5. If $\sec A = 157$ and $A + B = 90^\circ$, find the value of $\operatorname{cosec} B$. CBSE 2009, Foreign (30/2/1)
6. What is the maximum value of $1 \sec \theta$? CBSE Sample Paper III 2008
7. If $\tan A = 34$ and $A + B = 90^\circ$, then what is the value of $\cot B$? CBSE Sample Paper III 2008
8. Given $\tan \theta = 1\sqrt{5}$, what is the value of $\operatorname{cosec} 2\theta - \sec 2\theta \operatorname{cosec} 2\theta + \sec 2\theta$
 CBSE Sample Paper I 2008
9. If $\tan A = 512$, find the value of $(\sin A + \cos A) \sec A$.
 CBSE 2008, Foreign (30/2/1), (30/2/3)
10. If $\cos A = 725$, find the value of $\tan A + \cot A$. CBSE 2008, Foreign (30/2/2)

2 Marks :

1. Without using trigonometric tables, find the value of the following expression:
 $\sec(90^\circ - \theta) \cdot \operatorname{cosec} \theta - \tan(90^\circ - \theta) \cot \theta + \cos 225^\circ + \cos 265^\circ 3 \tan 27^\circ \cdot \tan 63^\circ$
 CBSE 2010, Delhi (30/1/1)
2. Find the value of $\operatorname{cosec} 30^\circ$, geometrically. CBSE 2010, Delhi (30/1/1)
3. Without using trigonometric tables, find the value of the following: CBSE 2010, Foreign (30/2/1)
 $\cot \theta \cdot \tan(90^\circ - \theta) - \sec(90^\circ - \theta) \operatorname{cosec} \theta + \sqrt{3} \cdot \tan 12^\circ \cdot \tan 60^\circ \cdot \tan 78^\circ$
4. Find the value of $\sec 45^\circ$ geometrically. CBSE 2010, Foreign (30/2/1)
5. Simplify : $\sin 3\theta + \cos 3\theta \sin \theta + \cos \theta + \sin \theta \cos \theta$ CBSE 2009, Delhi (30/1/1)
6. If $\cot \theta = 158$, then evaluate $(2 + 2 \sin \theta)(1 - \sin \theta)(1 + \cos \theta)(2 - 2 \cos \theta)$. CBSE 2009, Outside Delhi (30/1)

7. Find the value of $\tan 60^\circ$, geometrically. **CBSE 2009, Outside Delhi (30/1)**
8. Without using trigonometric tables, evaluate:
 $72\cos 70^\circ \sin 20^\circ + 32\cos 55^\circ \operatorname{cosec} 35^\circ \tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 85^\circ \tan 65^\circ$
CBSE 2009, Foreign (30/2/1)
9. Express $\sin 67^\circ + \cos 75^\circ$ in terms of trigonometric ratios of angles between 0° and 45°
CBSE Sample Paper II 2008
10. If A, B, C are interior angles of $\triangle ABC$, then show that
 $\cos\left(\frac{B+C}{2}\right) = \sin A/2$
CBSE Sample Paper II 2008
11. Without using trigonometric tables, find the value of
 $\cos 70^\circ \sin 20^\circ + \cos 57^\circ \operatorname{cosec} 33^\circ - 2\cos 60^\circ$
CBSE Sample Paper I 2008
12. If $\sec 4A = \operatorname{cosec}(A - 20^\circ)$, where $4A$ is an acute angle, find the value of A .
CBSE 2008, Foreign (30/2/1), (30/2/3)
13. In a $\triangle ABC$, right-angled at C , if $\tan A = 1/\sqrt{3}$, find the value of
 $\sin A \cos B + \cos A \sin B$
CBSE 2008, Foreign (30/2/1), (30/2/3)
14. If $\sec 2A = \operatorname{cosec}(A - 42^\circ)$, where $2A$ is an acute angle, find the value of A .
CBSE 2008, Foreign (30/2/2)
15. In $\triangle ABC$, right angled at A , if $\tan C = \sqrt{3}$, find the value of $\sin B \cos C + \cos B \sin C$.
CBSE 2008, Foreign (30/2/2)

3 Marks:

1. Prove the following:
 $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \tan A + \cot A$
CBSE 2010, Delhi (30/1/1)
2. Prove the following:
 $(\operatorname{cosec} A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$
CBSE 2010, Delhi (30/1/1)
3. If $\tan \theta + \sin \theta = m$ & $\tan \theta - \sin \theta = n$, show that $m^2 - n^2 = 4\sqrt{mn}$. **CBSE 2010, Foreign (30/2/1)**
4. Show that:
 $\left(1 + \frac{1}{\tan 2\theta}\right)\left(1 + \frac{1}{\cot 2\theta}\right) = \frac{1}{\sin 2\theta - \sin 4\theta}$
CBSE 2010, Foreign (30/2/1)
5. Find the value of $\sin 30^\circ$ geometrically. **CBSE 2009, Delhi (30/1/1)**
6. Without using trigonometrical tables, evaluate:
 $\cos 58^\circ \sin 32^\circ + \sin 22^\circ \cos 68^\circ - \cos 30^\circ \operatorname{cosec} 52^\circ \tan 18^\circ \tan 35^\circ \tan 60^\circ \tan 72^\circ \tan 55^\circ$
CBSE 2009, Delhi (30/1/1)
7. Prove that
 $\sec^2 \theta - \frac{\sin 2\theta - 2\sin 4\theta}{2\cos 4\theta - \cos 2\theta} = 1$
CBSE 2009, Foreign (30/2/1)
8. Evaluate:
 $\frac{2}{3}\operatorname{cosec} 258^\circ - \frac{2}{3}\cot 58^\circ \tan 32^\circ - \frac{5}{3}\tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$
CBSE 2009, Outside Delhi (30/1)
9. Prove that: $(1 + \cot A + \tan A)(\sin A - \cos A) = \sin A \tan A - \cot A \cos A$.
CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)
10. Without using trigonometric tables, evaluate the following:
 $2\left(\frac{\cos 58^\circ}{\sin 32^\circ}\right) - \sqrt{3}\left(\frac{\cos 38^\circ \operatorname{cosec} 52^\circ}{\tan 15^\circ \tan 60^\circ \tan 75^\circ}\right)$
CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)

11. Prove that

$$\frac{\sin \theta}{\cot \theta + \operatorname{cosec} \theta} = 2 + \frac{\sin \theta}{\cot \theta - \operatorname{cosec} \theta}$$

CBSE Sample Paper III 2008

12. Evaluate

$$\frac{\sec 29^\circ}{\operatorname{cosec} 61^\circ} + 2 \cot 8^\circ \cot 17^\circ \cot 45^\circ \cot 73^\circ \cot 82^\circ - 3(\sin 238^\circ + \sin 252^\circ)$$

CBSE Sample Paper III 2008

13. Prove that

$$\sqrt{\sec A - 1} / \sec A + 1 + \sqrt{\sec A + 1} / \sec A - 1 = 2 \operatorname{cosec} A$$

CBSE Sample Paper II 2008

14. Prove that: $1 + \cos A \sin A + \sin A 1 + \cos A = 2 \operatorname{cosec} A$

CBSE Sample Paper I 2008

15. Prove that $\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{\sin 2A - \cos 2A}$

CBSE Sample Paper I 2008

Unit -12, SOME APPLICATIONS OF TRIGONOMETRY

1 Mark:

1. If a tower 30 m high, casts a shadow $10\sqrt{3}$ m long on the ground, then what is the angle of elevation of the sun? CBSE 2017, Outside Delhi (30/1)

2. The ratio of the height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$. What is the angle of elevation of the sun? CBSE 2017, Delhi (30/1/1)

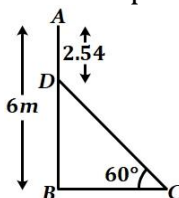
3. A ladder 15 m long makes an angle of 60° with the wall. Find the height of the point where the ladder touches the wall. CBSE 2017, Foreign (30/2/1)

4. A pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then find the angle of elevation of the sun. CBSE Sample Paper 2017

5. An observer, 1.7 m tall, is $20\sqrt{3}$ m away from a tower. The angle of elevation from the eye of observer to the top of tower is 30° . Find the height of tower.

CBSE 2016, Foreign (30/2/1)

6. In figure, AB is a 6 m high pole and CD is a ladder inclined at an angle of 60° to the horizontal and reaches up to a point D of pole. If AD = 2.54 m, find the length of the



ladder. (Use $\sqrt{3} = 1.73$)

CBSE 2016, Delhi (30/1/1)

7. A ladder, leaning against a wall, makes an angle of 60° with the horizontal. If the foot of the ladder is 2.5 m away from the wall, find the length of the ladder.

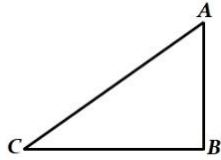
CBSE 2016, Outside Delhi (30/1)

8. If the ratio between the length of the shadow of a tower and its height is $\sqrt{3}:1$, then what is the angle of elevation of Sun? CBSE Sample Paper 2015

9. The tops of two towers of height x and y , standing on level ground, subtend angles of 30° and 60° respectively at the centre of the line joining their feet, then find $x:y$.

CBSE 2015, Delhi (30/1/1)

10. A pole casts a shadow of length $2\sqrt{3} \text{ m}$ on the ground, when the sun's elevation is 60° . Find the height of the pole. **CBSE 2015, Foreign (30/2/1)**



11. In figure a tower AB is 20 m high and BC , its shadow on the ground, is $20\sqrt{3} \text{ m}$ long. Find the Sun's altitude. **CBSE 2015, Outside Delhi (30/1)**
12. The angle of depression of a car parked on the road from the top of a 150 m high tower is 30° . The distance of the car from the tower (in metres) is **CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)**

- A) $50\sqrt{3}$
B) $150\sqrt{3}$
C) $150\sqrt{2}$
D) 75

13. The angle of depression of a car, standing on the ground, from the top of a 75 m , high tower, is 30° . The distance of the car from the base of the tower (in m) is : **CBSE 2013, Delhi (30/1/1)**

- A) $25\sqrt{3}$
B) $50\sqrt{3}$
C) $75\sqrt{3}$
D) 150

14. The length of shadow of a tower on the plane ground is $\sqrt{3}$ times the height of the tower. The angle of elevation of sun is: **CBSE 2012, Delhi (30/1/1)**

- A) 45°
B) 30°
C) 60°
D) 90°

15. From a point on the ground which is 15 m away from the foot of a vertical tower, the angle of elevation of the top of the tower, is found to be 60° . The height of the tower (in metres) is **CBSE 2012, Foreign (30/2/1)**

- A) $5\sqrt{3}$
B) $15\sqrt{3}$
C) 15
D) 7.5

16. A kite is flying at a height of 30 m from the ground. The length of string from the kite to the ground is 60 m . Assuming that there is no slack in the string, the angle of elevation of the kite at the ground is **CBSE 2012, Outside Delhi (30/1)**

- A) 45°
B) 30°
C) 60°
D) 90°

17. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 45° . The height of the tower (in metres) is

CBSE 2011, Delhi (30/1/1)

- A) 15
- B) 30
- C) $30\sqrt{3}$
- D) $10\sqrt{3}$

18. At some time of the day, the length of the shadow of a tower is equal to its height. Then the sun's altitude at that time is

CBSE 2011, Foreign (30/2/1)

- A) 30°
- B) 60°
- C) 90°
- D) 45°

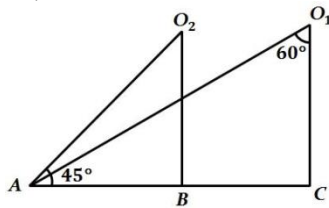
19. A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45° . Then the height (in meters) of the tower is

CBSE 2011, Outside Delhi (30/1)

- A) $25\sqrt{2}$
- B) $25\sqrt{3}$
- C) 25
- D) 12.5

20. If Fig. what are the angles of depression from the observing positions O_1 and O_2 of the object at A?

CBSE Sample Paper III 2008



21. The height of a tower is 10 cm. Calculate the height of its shadow when Sun's altitude is 45° .

CBSE Sample Paper II 2008

2 or 3 Marks:

1. On a straight line passing through the foot of a tower, two points C and D are at distances of 4 m and 16 m from the foot respectively. If the angles of elevation from C and D of the top of the tower are complementary, then find the height of the tower.

CBSE 2017, Outside Delhi (30/1)

2. A moving boat is observed from the top of a 150 m high cliff moving away from the cliff. The angle of depression of the boat changes from 60° to 45° in 2 minutes. Find the speed of the boat in m/h.

CBSE 2017, Delhi (30/1/1)

3. The shadow of a tower at a time is three times as long as its shadow when the angle of elevation of the sun is 60° . Find the angle of elevation of the sun at the time of the longer shadow.

CBSE 2017, Foreign (30/2/1)

4. From the top of a lighthouse 75 m high, the angles of depression of two ships are observed to be 30° and 45° respectively. If one ship is directly behind the other on the same side of the lighthouse then find the distance between the two ships.

CBSE Sample Paper 2017

5. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of hill as 30° . Find the distance of the hill from the ship and the height of the hill.

CBSE 2016, Outside Delhi (30/1)

6. The angles of depression of the top and bottom of a 50 m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building. (use $\sqrt{3}=1.73$) **CBSE 2016, Delhi (30/1/1)**

7. Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60° . Find the distance between the two men. (Use $\sqrt{3}=1.73$) **CBSE 2016, Foreign (30/2/1)**

8. The angle of elevation of an aeroplane from a point A on the ground is 60° . After a flight of 15 seconds, the angle of elevation changes to 30° . If the aeroplane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the plane in km/hr.

CBSE 2015, Outside Delhi (30/1)

9. At a point A, 20 metres above the level of water in a lake, the angle of elevation of a cloud is 30° . The angle of depression of the reflection of the cloud in the lake, at A is 60° . Find the distance of the cloud from A.

CBSE 2015, Outside Delhi (30/1)

10. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 45° . If the tower is 30 m high, find the height of the building. **CBSE 2015, Delhi (30/1/1)**

11. From the top of a tower of height 50 m, the angles of depression of the top and bottom of a pole are 30° and 45° respectively.

Find

CBSE 2015, Foreign (30/2/1)

I. how far the pole is from the bottom of a tower,

II. the height of the pole. (Use $\sqrt{3}=1.732$)

12. The angle of elevation of an aeroplane from a point on the ground is 60° . After a flight of 30 seconds the angle of elevation becomes 30° . If the aeroplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the aeroplane.

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

13. From the top of a 60 m high building, the angles of depression of the top and the bottom of a tower are 45° and 60° respectively. Find the height of the tower. [Take $\sqrt{3}=1.73$]

CBSE 2014, Outside Delhi (30/3)

14. The horizontal distance between two poles is 15 m. The angle of depression of the top of first pole as seen from the top of second pole is 30° . If the height of the second pole is 24 m, find the height of the first pole. [Use $\sqrt{3}=1.732$]

CBSE 2013, Delhi (30/1/1)

15. The angles of depression of two ships from the top of a light house and on the same side of it are found to be 45° and 30° . If the ships are 200 m, apart, find the height of the light house.

CBSE 2012, Delhi (30/1/1)

16. From the top of a tower 50 m high, the angle of depression of the top of a pole is 45° and from the foot of the pole, the angle of elevation of the top of the tower is 60° . Find the height of the pole if the pole and tower stand on the same plane.

CBSE 2012, Foreign (30/2/1)

17. The angles of depression of the top and bottom of a tower as seen from the top of a $60\sqrt{3}$ m high cliff are 45° and 60° respectively. Find the height of the tower.

CBSE 2012, Outside Delhi (30/1)

18. From the top of a vertical tower, the angles of depression of two cars, in the same straight line with the base of the tower, at an instant are found to be 45° and 60° . If the

cars are 100 m apart and are on the same side of the tower, find the height of the tower.
[Use $\sqrt{3}=1.73$]

CBSE 2011, Outside Delhi (30/1)

19. From the top of a tower 100 m high, a man observes two cars on the opposite sides of the tower with angles of depression 30° and 45° respectively. Find the distance between the cars. [Use $\sqrt{3}=1.73$]

CBSE 2011, Delhi (30/1/1)

20. A ladder of length 6 m makes an angle of 45° with the floor while leaning against one wall of a room. If the foot of the ladder is kept fixed on the floor and it is made to lean against the opposite wall of the room, it makes an angle of 60° with the floor. Find the distance between these two walls of the room.

CBSE 2011, Foreign (30/2/1)

3 Marks:

1. An aeroplane is flying at a height of 300 m above the ground. Flying at this height, the angles of depression from the aeroplane of two points on both banks of a river in opposite directions are 45° and 60° respectively. Find the width of the river. [Use $\sqrt{3}=1.732$]

CBSE 2017, Outside Delhi (30/1)

2. The angle of elevation of a cloud from a point 60 m above the surface of the water of a lake is 30° and the angle of depression of its shadow in water of lake is 60° . Find the height of the cloud from the surface of water.

CBSE 2017, Delhi (30/1/1)

3. From the top of a 7 m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of its foot is 45° . Find the height of the tower. [Use $\sqrt{3}=1.732$]

CBSE 2017, Foreign (30/2/1)

4. From a point 100 m above a lake the angle of elevation of a stationary helicopter is 30° and the angle of depression of reflection of the helicopter in the lake is 60° . Find the height of the helicopter above the lake.

CBSE Sample Paper 2017

5. A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation of the bird is 45° . The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 seconds, the angle of elevation of the bird from the same point is 30° . Find the speed of flying of the bird. (Take $\sqrt{3}=1.732$)

CBSE 2016, Delhi (30/1/1)

6. The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60° . From a point Y, 40 m vertically above X, the angle of elevation of the top Q of tower is 45° . Find the height of the tower PQ and the distance PX. (Use $\sqrt{3}=1.73$)

CBSE 2016, Outside Delhi (30/1)

7. A vertical tower stands on a horizontal plane and is surmounted by a flagstaff of height 5 m. From a point on the ground the angles of elevation of the top and bottom of the flagstaff are 60° and 30° respectively. Find the height of the tower and the distance of the point from the tower. (take $\sqrt{3}=1.732$)

CBSE 2016, Foreign (30/2/1)

8. From the top of tower, 100 m high, a man observes two cars on the opposite sides of the tower with the angles of depression 30° & 45° respectively. Find the distance between the cars. (Use $\sqrt{3}=1.73$.)

CBSE Sample Paper 2016

9. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 20 m high building are 45° & 60° respectively. Find the higher of the tower.
CBSE Sample Paper 2016
10. From a point P on the ground the angle of elevation of the top of a tower is 30° and that of the top of a flag staff fixed on the top of the tower, is 60° . If the length of the flag staff is 5 m, find the height of the tower.
CBSE 2015, Delhi (30/1/1)
11. Two poles of equal heights are standing opposite to each other on either side of the road which is 80 m wide. From a point P between them on the road, the angle of elevation of the top of a pole is 60° and the angle of depression from the top of another pole at point P is 30° . Find the heights of the poles and the distances of the point P from the poles.
CBSE 2015, Foreign (30/2/1)
12. The angle of elevation of the top of a tower at a distance of 120 m from a point A on the ground is 45° . If the angle of elevation of the top of a flagstaff fixed at the top of the tower, at A is 60° , then find the height of the flagstaff. [Use $\sqrt{3}=1.73$]
CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
13. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower the foot of the building is 60° . If the tower is 60 m high, find the height of the building.
CBSE 2013, Delhi (30/1/1)
14. The angle of elevation of the top of a hill at the foot of a tower is 60° and the angle of depression from the top of the tower of the foot of the hill is 30° . If the tower is 50 m high, find the height of the hill.
CBSE 2012, Delhi (30/1/1)
15. The angle of depression from the top of a tower of a point A on the ground is 30° . On moving a distance of 20 m from the point A towards the foot of the tower to a point B , the angle of elevation of the top of the tower from the point B is 60° . Find the height of the tower and its distance from the point A .
CBSE 2012, Foreign (30/2/1)
16. The angles of elevation and depression of the top and bottom of a light-house from the top of a 60 m high building are 30° and 60° respectively. Find
I. the difference between the heights of the light-house and the building.
II. the distance between the light-house and the building.
CBSE 2012, Outside Delhi (30/1)
17. Two poles of equal heights are standing opposite to each other on either side of the road, which is 100 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30° , respectively. Find the height of the poles.
CBSE 2011, Delhi (30/1/1)
18. The shadow of a tower standing on a level ground is found to be 30 m longer when the sun's altitude is 30° than when it is 60° . Find the height of the tower.
CBSE 2011, Foreign (30/2/1)
19. The angle of elevation of the top of a vertical tower from a point on the ground is 60° . From another point 10 m vertically above the first, its angle of elevation is 30° . Find the height of the tower.
CBSE 2011, Outside Delhi (30/1)

4 Marks:

1. From the top of a 7 m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of the foot of the tower is 30° . Find the height of the tower.

CBSE 2010, Delhi (30/1/1)

2. From a window (9 m above the ground) of a house in a street, the angles of elevation and depression of the top and foot of another house on the opposite side of the street are 30° and 60° respectively. Find the height of the opposite house and the width of the street. [Use $\sqrt{3}=1.732$]

CBSE 2010, Foreign (30/2/1)

3. A vertical pedestal stands on the ground and is surmounted by a vertical flag staff of height 5 m. At a point on the ground the angles of elevation of the bottom and the top of the flag staff are 30° and 60° respectively. Find the height of the pedestal.

CBSE 2010, Foreign (30/2/1)

4. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six second later, the angle of depression of the car is found to be 60° . Find the time taken by the car to reach the foot of the tower from this point.

CBSE 2009, Delhi (30/1/1)

5. The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 50 m high, find the height of the building.

CBSE 2009, Foreign (30/2/1)

6. An aeroplane when flying at a height of 3125 m from the ground passes vertically below another plane at an instant when the angles of elevation of the two planes from the same point on the ground are 30° and 60° respectively. Find the distance between the two planes at that instant.

CBSE 2009, Outside Delhi (30/1)

7. The angle of elevation of an aeroplane from a point A on the ground is 60° . After a flight of 30 seconds, the angle of elevation changes to 30° . If the plane is flying at a constant height of $3600\sqrt{3}$ m, find the speed in km/hour, of the plane.

CBSE 2008, Foreign (30/2/1)

8. An aeroplane, when 3000 m high, passes vertically above another aeroplane at an instant, when the angle of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes. (Use $\sqrt{3}=1.732$)

CBSE 2008, Foreign (30/2/2)

9. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the time take by the car to reach the foot of the tower from this point.

CBSE 2008, Foreign (30/2/3)

10. There are two poles, one each on either bank of a river, just opposite to each other. One pole is 60 m high. From the top of this pole, the angles of depression of the top and the foot of the other pole are 30° and 60° respectively. Find the width of the river and the height of the other pole.

CBSE Sample Paper II 2008

11. From the top of a building 100 m high, the angles of depression of the top and bottom of a tower are observed to be 45° and 60° respectively. Find the height of the tower. Also find the distance between the foot of the building and bottom of the tower.

CBSE Sample Paper I 2008

12. The angle of elevation of the top a tower at a point on the level ground is 30° . After walking a distance of 100 m towards the foot of the tower along the horizontal line through the foot of the tower on the same level ground, the angle of elevation of the top of the tower is 60° . Find the height of the tower.

CBSE Sample Paper I 2008

13. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Using the above, solve the following:

A ladder reaches a window which is 12 m above the ground on one side of the street.

Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 9 m high. Find the width of the street if the length of the ladder is 15 m.

CBSE Sample Paper I 2008

14. From the top and foot of a tower 40 m high, the angle of elevation of the top of a light house is found to be 30° and 60° respectively. Find the height of the lighthouse. Also find the distance of the top of the lighthouse from the foot of the tower.

Unit - 13, STATISTICS

Dear all, in this chapter For exam purpose, you can solve the problems given below 100% will get out of 6 marks.

“Ogive” – 3 marks.

C.I	0-3	3-6	6-9	9-12	12-15
f	9	3	5	3	1

C.I	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f	2	12	2	4	3	4	3

C.I	0-10	10-20	20-30	30-40	40-50	50-60
f	7	4	5	3	2	4

C.I	20-30	30-40	40-50	50-60	60-70
f	8	7	6	4	3

C.I	0-100	100-200	200-300	300-400	400-500
f	12	8	16	21	18

C.I	0-2	2-4	4-6	6-8	8-10
f	1	2	1	5	6

C.I	100-120	120-140	140-160	160-180	180-200
f	12	14	8	6	10

C.I	1-5	5-9	9-13	13-17	17-21	21-25
f	4	5	8	10	8	7

C.I	0.2-0.4	0.4-0.6	0.6-0.8	0.8-1.0	1.0-1.2
f	7	13	4	8	9

C.I	0-6	6-12	12-18	18-24	24-30	30-36
f	23	28	16	14	9	5

C.I	0-10	10-20	20-30	30-40	40-50
f	66	54	16	14	12

C.I	0-5	5-10	10-15	15-20	20-25	25-30
f	5	7	3	4	8	9

C.I	100-150	150-200	200-250	250-300	300-350
f	44	16	18	24	35

C.I	1-3	3-5	5-7	7-9	9-11
f	8	15	12	7	6

C.I	45-55	55-65	65-75	75-85	85-95
f	3	10	11	8	3

C.I	4-14	14-24	24-34	34-44	44-54	54-64
f	10	35	52	61	38	29

C.I	0.5-1.0	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0
f	4	7	8	9	14

Mean or Median or Mode(there is option): 3 marks

C.I	10-25	25-40	40-55	55-70	70-85	85-100
f	2	3	7	6	6	6

C.I	15-25	25-35	35-45	45-55	55-65	65-75	75-85
f	6	11	7	4	4	2	1

C.I	0-2	2-4	4-6	6-8	8-10	10-12	12-14
f	1	2	1	5	6	2	3

C.I	100-120	120-140	140-160	160-180	180-200
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f	12	14	8	6	10
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C.I	11-13	13-15	15-17	17-19	19-21	21-23	23-25
f	7	6	9	13	20	5	4

C.I	65-68	68-71	71-74	74-77	77-80	80-83	83-86
f	2	4	3	8	7	4	2

C.I	50-52	53-55	56-58	59-61	62-64
f	15	110	135	115	25

C.I	100-150	150-200	200-250	250-300	300-350
f	4	5	12	2	2

C.I	45-55	55-65	65-75	75-85	85-95
f	3	10	11	8	3

C.I	1-3	3-5	5-7	7-9	9-11
f	7	8	2	2	1

C.I	5-15	15-25	25-35	35-45	45-55	55-65
f	6	11	21	23	14	5

C.I	0-3	3-6	6-9	9-12	12-15
f	3	2	4	6	5

C.I	0-10	10-20	20-30	30-40	40-50	50-60
f	12	11	8	6	7	6

C.I	0-5	5-10	10-15	15-20	20-25
f	2	1	3	1	3

C.I	2-6	6-10	10-14	14-18	18-22
f	3	2	7	1	2

C.I	0-20	20-40	40-60	60-80	80-100	100-120
f	9	7	8	15	4	5

C.I	3-13	13-23	23-33	33-43	43-53
f	3	2	1	4	3

C.I	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f	3	4	6	8	4	2	3

C.I	1-3	3-5	5-7	7-9	9-11
f	10	15	12	7	6

C.I	0-2	2-4	4-6	6-8	8-10	10-12
f	1	2	1	5	6	5

C.I	45-55	55-65	65-75	75-85	85-95
f	3	10	6	8	3

C.I	20-30	30-40	40-50	50-60	60-70	70-80
f	1	4	3	5	3	4

C.I	0-5	5-10	10-15	15-20	20-25
f	9	5	8	7	1

Unit- 15 SURFACE AREAS AND VOLUMES

1 Mark:

1. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of hemisphere?

CBSE 2017, Delhi (30/1/1)

2. A solid metallic cuboid of dimensions $9\text{ m} \times 8\text{ m} \times 2\text{ m}$ is melted and recast into solid cubes of edge 2 m . Find the number of cubes so formed.

CBSE 2017, Foreign (30/2/1)

3. The circumference of the base of a cone is 44 cm and the slant height is 25 cm . Find the curved surface area of the cone.

CBSE Sample Paper 2015

4. If the radius of the base of a right circular cylinder is halved, keeping the height the same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is: CBSE 2012, Delhi (30/1/1)

- A) 1:2
- B) 2:1
- C) 1:4
- D) 4:1

5. The radii of the circular ends of a bucket of height 40 cm are 24 cm and 15 cm . The slant height (in cm) of the bucket is :

CBSE 2012, Foreign (30/2/1)

- A) 51

- B) 49
C) 43
D) 41

6. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is

CBSE 2012, Outside Delhi (30/1)

- A) 1:2
B) 1:4
C) 1: 6
D) 1:8

7. A sphere of diameter 18 *cm* is dropped into a cylindrical vessel of diameter 36 *cm*, partly filled with water. If the sphere is completely submerged, then the water level rises (in *cm*) by

CBSE 2011, Delhi (30/1/1)

- A) 3
B) 4
C) 5
D) 6

8. A solid is hemispherical at the bottom and conical (of same radius) above it. If the surface areas of the two parts are equal, then the ratio of its radius and the slant height of the conical part is

CBSE 2011, Foreign (30/2/1)

- A) 2:1
B) 1:2
C) 1:4
D) 4:1

9. The radius (in *cm*) of the largest right circular cone that can be cut out from a cube of edge 4.2 *cm* is

CBSE 2011, Outside Delhi (30/1)

- A) 4.2
B) 2.1
C) 8.4
D) 1.05

10. The slant height of a frustum of a cone is 4 *cm* and the perimeters (circumferences) of its circular ends are 18 *cm* and 6 *cm*. Find the curved surface area of the frustum. [Use $\pi=22/7$]

CBSE 2010, Delhi (30/1/1)

11. The slant height of a frustum of a cone is 10 *cm*. If the height of the frustum is 8 *cm* then find the difference of the radii of its two circular ends. **CBSE 2010, Foreign (30/2/1)**

12. A cylinder and a cone are of same base radius and of same height. Find the ratio of the volume of cylinder to that of the cone.

CBSE 2009, Delhi (30/1/1)

13. The surface area of a sphere is 616 *cm*². Find its radius.

CBSE 2008, Foreign (30/2/1), (30/2/2), (30/2/3)

14. A cylinder, a cone and hemisphere are of equal base and have the same height. What is the ratio in their volumes?

CBSE Sample Paper I 2008

2 Marks:

1. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel?
CBSE Sample Paper 2016
2. Find the number of coins of 1.5 cm diameter and 0.2 cm thickness to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm. **CBSE Sample Paper 2016**
3. If the total surface area of a solid hemisphere is 462 cm², find its volume.
[Take $\pi=22/7$] **CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)**
4. A solid sphere of radius 10.5 cm is melted and recast into smaller solid cones, each of radius 3.5 cm and height 3 cm. Find the number of cones so formed. (Use $\pi=22/7$).
CBSE 2012, Outside Delhi (30/1)
5. The volume of a hemisphere is 242512 cm³. Find its curved surface area. [Use $\pi=22/7$].
CBSE 2012, Delhi (30/1/1)
6. A solid is in the shape of cone mounted on a hemisphere of same base radius. If the curved surface areas of the hemispherical part and the conical part equal, then find the ratio of the radius and the height of the conical part. **CBSE 2012, Foreign (30/2/1)**
7. Two cubes each of volume 27 cm³ are joined end to end to form a solid. Find the surface area of the resulting cuboid. **CBSE 2011, Outside Delhi (30/1)**
8. A cone of height 20 cm and radius of base 5 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the diameter of the sphere.
CBSE 2011, Outside Delhi (30/1)
9. Two cubes, each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid.
CBSE 2011, Delhi (30/1/1)
10. The dimensions of a metallic cuboid are 100 cm×80 cm×64 cm. It is melted and recast into a cube. Find the surface area of the cube. **CBSE 2011, Foreign (30/2/1)**

3 Marks:

1. Water in a canal, 5.4 m wide and 1.8 m deep, is flowing with a speed of 25 km/hour. How much area can it irrigate in 40 minutes, if 10 cm of standing water is required for irrigation?
CBSE 2017, Outside Delhi (30/1)
2. The slant height of a frustum of a cone is 4 cm and the perimeters of its circular ends are 18 cm and 6 cm. Find the curved surface area of the frustum.
CBSE 2017, Outside Delhi (30/1)
3. The dimensions of a solid iron cuboid are 4.4 m×2.6 m×1.0 m. It is melted and recast into a hollow cylindrical pipe of 30 cm inner radius and thickness 5 cm. Find the length of the pipe.
CBSE 2017, Outside Delhi (30/1)
4. The 3/4 th part of a conical vessel of internal radius 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height of water in cylindrical vessel.
CBSE 2017, Delhi (30/1/1)
5. The radius and height of a solid right circular cone are in the ratio of 5:12. If its volume is 314 cm³, find its total surface area. [Take $\pi=3.14$]. **CBSE 2017, Foreign (30/2/1)**

6. A cylindrical pipe has inner diameter of 4 cm and water flows through it at the rate of 20 meter per minute. How long would it take to fill a conical tank of radius 40 cm and depth 72 cm?

CBSE Sample Paper 2017

7. Find the number of spherical lead shots, each of diameter 6 cm that can be made from a solid cuboid of lead having dimensions 24 cm×22 cm×12 cm. **CBSE Sample Paper 2017**

8. A wooden souvenir is made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm then find the total cost of polishing the souvenir at the rate of Rs. 10 per cm².

CBSE Sample Paper 2017

9. In figure, a tent is in the shape of a cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the tent if the canvas is available at the rate of ₹ 500/sq.metre. (Use $\pi=227$).

CBSE 2016, Outside Delhi (30/1)

10. A conical vessel, with base radius 5 cm and height 24 cm, is full of water. This water is emptied in to a cylindrical vessel of base radius 10 cm. Find the height to which the water will rise in the cylindrical vessel. (Use $\pi=227$)

CBSE 2016, Outside Delhi (30/1)

11. A sphere of diameter 12, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises by 359 cm. Find the diameter of the cylindrical vessel.

CBSE 2016, Outside Delhi (30/1)

12. In figure, is a decorative block, made up of two solids – a cube and a hemisphere. The base of the block is a cube of side 6 cm and the hemisphere fixed on the top has a diameter of 3.5 cm. Find the total surface area of the block. (use $\pi=227$)

CBSE 2016, Delhi (30/1/1)

13. A well of diameter 4 m is dug 21 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 3 m to form an embankment. Find the height of the embankment.

CBSE 2016, Delhi (30/1/1)

14. The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 sq.cm, find the volume of the cylinder. (use $\pi=227$)

CBSE 2016, Delhi (30/1/1)

15. A hemispherical tank, of diameter 3 m, is full of water. It is being emptied by a pipe at the rate of 347 litre per second. How much time will it take to make the tank half empty? [Use $\pi=227$]

CBSE 2016, Foreign (30/2/1)

16. A cylindrical tub, whose diameter is 12 cm and height 15 cm is full of ice-cream. The whole ice-cream is to be divided into 10 children in equal ice-cream cones, with conical base surmounted by hemispherical top. If the height of conical portion is twice the diameter of base, find the diameter of conical part of ice-cream cone.

CBSE 2016, Foreign (30/2/1)

17. A metal container, open from the top, is in the shape of a frustum of a cone of height 21 cm with radii of its lower an upper circular ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at the rate of ₹ 35 per litre. [Use $\pi=22/7$]

CBSE 2016, Foreign (30/2/1)

18. Water is flowing at the rate of 0.7 m/sec through a circular pipe whose internal diameter is 2 cm into a cylindrical tank, the radius of whose base is 40 cm . Determine the increase in the level of water in half hour. **CBSE Sample Paper 2016**
19. The perimeters of the ends of the frustum of a cone are 207.24 cm and 169.56 cm . If the height of the frustum be 8 cm , find the whole surface area of the frustum. (Use $\pi=3.14$) **CBSE Sample Paper 2016**
20. Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost. If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m , and the canvas to be used costs ₹ 100 per sq.m, find the amount, the associations will have to pay. What values are shown by these associations? [Use $\pi=22/7$] **CBSE 2015, Outside Delhi (30/1)**
21. A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is filled into 72 cylindrical bottles of diameter 6 cm . Find the height of the each bottle, if 10% liquid is wasted in this transfer. **CBSE 2015, Outside Delhi (30/1)**
22. A cubical block of side 10 cm is surmounted by a hemisphere. What is the largest diameter that the hemisphere can have? Find the cost of painting the total surface area of the solid so formed, at the rate of ₹ 5 per 100 sq.cm. [Use $\pi=3.14$] **CBSE 2015, Outside Delhi (30/1)**
23. 504 cones, each of diameter 3.5 cm and height 3 cm , are melted and recast into a metallic sphere. Find the diameter of the sphere and hence find its surface area. [Use $\pi=22/7$] **CBSE 2015, Outside Delhi (30/1)**
24. From each end of a solid metal cylinder, metal was scooped out in hemispherical form of same diameter. The height of the cylinder is 10 cm and its base is of radius 4.2 cm . The rest of the cylinder is melted and converted into a cylindrical wire of 1.4 cm thickness. Find the length of the wire [Use $\pi=22/7$]. **CBSE 2015, Outside Delhi (30/1)**
25. In figure, from the top of a solid cone of height 12 cm and base radius 6 cm , a cone of height 4 cm is removed by a plane parallel to the base. Find the total surface area of the remaining solid. (Use $\pi=22/7$ and $\sqrt{5}=2.236$). **CBSE 2015, Delhi (30/1/1)**
26. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is 16656 cm^3 . Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of ₹ 10 per cm^2 . [Use $\pi=22/7$] **CBSE 2015, Delhi (30/1/1)**
27. In figure, from a cuboidal solid metallic block, of dimension $15 \text{ cm} \times 10 \text{ cm} \times 5 \text{ cm}$, a cylindrical hole of diameter 7 cm is drilled out. Find the surface area of the remaining block [Use $\pi=22/7$]. **CBSE 2015, Delhi (30/1/1)**
28. Two spheres of same metal weight 1 kg and 7 kg . The radius of the smaller sphere is 3 cm . The two spheres are melted to form a single big sphere. Find the diameter of the new sphere. **CBSE 2015, Foreign (30/2/1)**

29. A metallic cylinder has radius 3 cm and height 5 cm. To reduce its weight, a conical hole is drilled in the cylinder. The conical hole has a radius of 32cm and its depth is 89cm. Calculate the ratio of the volume of metal left in the cylinder to the volume of metal taken out in conical shape.
CBSE 2015, Foreign (30/2/1)
30. A solid right-circular cone of height 60 cm and radius 30 cm is dropped in a right-circular cylinder full of water of height 180 cm and radius 60 cm. Find the volume of water left in the cylinder, in cubic metres. [Use $\pi=227$]
CBSE 2015, Foreign (30/2/1)
31. The largest possible sphere is carved out of a wooden solid cube of side 7 cm. Find the volume of the wood left. [Use $\pi=227$]
CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
32. Water in a canal, 6 m wide and 1.5 m deep, is flowing at a speed of 4 km/h. How much area will it irrigate in 10 minutes, if 8 cm, of standing water is needed for irrigation?
CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)
33. A vessel is in the form of a hemispherical bowl surmounted by a hollow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the total surface area of the vessel. [Use $\pi=227$]
CBSE 2013, Delhi (30/1/1)
34. A wooden toy was made by scooping out a hemisphere of same radius from each end of a solid cylinder. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the volume of wood in the toy. [Use $\pi=227$]
CBSE 2013, Delhi (30/1/1)
35. A hemispherical bowl of internal radius 9 cm is full of water. Its contents are emptied in a cylindrical vessel of internal radius 6 cm. Find the height of water in the cylindrical vessel.
CBSE 2012, Outside (30/1)
36. From a solid cylinder of height 7 cm and base diameter 12 cm, a conical cavity of same height and same base diameter is hollowed out. Find the total surface area of the remaining solid. [Use $\pi=227$].
CBSE 2012, Delhi (30/1/1)
37. A cylinder bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, then find the radius and slant height of the heap.
CBSE 2012, Delhi (30/1/1)
38. A sphere of diameter 6 cm is dropped into a cylindrical vessel, partly filled with water, whose diameter is 12 cm. If the sphere is completely submerged in water, by how much will the surface of water be raised in the cylindrical vessel?
CBSE 2012, Foreign (30/2/1)
39. An open metal bucket is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at Rs. 30 per litre. [Use $\pi=227$]
CBSE 2011, Outside Delhi (30/1)
40. The radii of the circular ends of a bucket of height 15 cm are 14 cm and r ($r < 14$ cm). If the volume of bucket is 5390 cm³, then find the value of r . [Use $\pi=22/7$]
CBSE 2011, Delhi (30/1/1)

41. From a solid cylinder of height 14 cm and base diameter 7 cm , two equal conical holes each of radius 2.1 cm and height 4 cm are cut off. Find the volume of the remaining solid.

CBSE 2011, Foreign (30/2/1)

42. The radii of the circular ends of a solid frustum of a cone are 18 cm and 12 cm and its height is 8 cm . Find its total surface area. [Use $\pi=3.14$] **CBSE 2011, Foreign (30/2/1)**

43. The rain-water collected on the roof of a building, of dimensions $22\text{ m} \times 20\text{ m}$, is drained into a cylindrical vessel having base diameter 2 m and height 3.5 m . If the vessel is full up to the brim, find the height of rain-water on the roof. [Use $\pi=22/7$]

CBSE 2010, Foreign (30/2/1)

44. The area of an equilateral triangle is $49\sqrt{3}\text{ cm}^2$. Taking each angular point as centre, circle are drawn with radius equal to half the length of the side of the triangle. Find the area of triangle not included in the circles. [Take $\sqrt{3}=1.73$]

CBSE 2009, Outside Delhi (30/1)

45. Figure shows a decorative block which is made of two solids – a cube and a hemisphere. The base of the block is a cube with edge 5 cm and the hemisphere, fixed on the top, has a diameter of 4.2 cm . Find the total surface area of the block. [Take $\pi=22/7$]

CBSE 2009, Outside Delhi (30/1)

46. A square field and an equilateral triangular park have equal perimeters. If the cost of ploughing the field at rate of Rs. $5/\text{m}^2$ is Rs. 720 , find the cost of maintaining the park at the rate of Rs. $20/\text{m}^2$.

CBSE Sample Paper I 2008

47. An iron solid sphere of radius 3 cm is melted and recast into small spherical balls of radius 1 cm each. Assuming that there is no wastage in the process, find the number of small spherical balls made from the given sphere.

CBSE Sample Paper I 2008

4 Marks:

1. In a rain-water harvesting system, the rain-water from a roof of $22\text{ m} \times 20\text{ m}$ drains into a cylindrical tank having diameter of base 2 m and height 3.5 m . If the tank is full, find the rainfall in cm . Write your views on water conservation.

CBSE 2017, Outside Delhi (30/1)

2. The height of a cone is 10 cm . The cone is divided into two parts using a plane parallel to its base at the middle of its height. Find the ratio of the volumes of the two parts.

CBSE 2017, Delhi (30/1/1)

3. In a hospital used water is collected in a cylindrical tank of diameter 2 m and height 5 m . After recycling, this water is used to irrigate a park of hospital whose length is 25 m and breadth is 20 m . If the tank is filled completely then what will be the height of standing water used for irrigating the park. Write your views on recycling of water.

CBSE 2017, Delhi (30/1/1)

4. A well of diameter 3 m is dug 14 m deep. The soil taken out of it is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankment.

CBSE 2017, Foreign (30/2/1)

5. In a rectangular park of dimensions $50\text{ m} \times 40\text{ m}$, a rectangular pond is constructed so that the area of grass strip of uniform width surrounding the pond would be 1184 m^2 . Find the length and breadth of the pond.

CBSE 2017, Foreign (30/2/1)

6. A metallic right circular cone 20 cm high and whose vertical angle is 60° is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of uniform diameter 116 cm , find the length of the wire.

CBSE 2017, Foreign (30/2/1)

7. A donor agency ensures milk is supplied in containers, which are in the form of a frustum of a cone to be distributed to flood victims in a camp. The height of each frustum is 30 cm and the radii of whose lower and upper circular ends are 20 cm and 40 cm respectively. If this milk is available at the rate of Rs. 35 per litre and 880 litres of milk is needed daily for a camp.

CBSE Sample Paper 2017

- a) Find how many milk containers are needed daily for the camp.
b) What daily cost will it put on the donor agency?
c) What value of the donor agency is depicted in this situation?
8. 50 circular discs, each of radius 7 cm and thickness 0.5 cm are placed one above the other. Find the total surface area of the solid so formed. Find how much space will be left in a cubical box of side 25 cm if the solid formed is placed inside it.
9. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 m , with conical upper part of same base radius but of height 2.1 m . If the canvas used to make the tents costs ₹ 120 per sq.m , find the amount shared by each school to set up the tents. What value is generated by the above problem? (Use $\pi=22/7$)

CBSE Sample Paper 2017

CBSE 2016, Outside Delhi (30/1)

10. A bucket open at the top is in the form of a frustum of a cone with a capacity of 12308.8 cm^3 . The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of metal sheet used in making the bucket. (Use $\pi=3.14$)

CBSE 2016, Delhi (30/1/1)

11. In figure is shown a right circular cone of height 30 cm . A small cone is cut off from the top by a plane parallel to the base. If the volume of the small cone is $1/27$ of the volume of given cone, find at what height above the base is the section made.

CBSE 2016, Foreign (30/2/1)

12. A right triangle having sides 15 cm and 20 cm is made to revolve about its hypotenuse. Find the Volume and Surface Area of the double cone so formed. (Use $\pi=3.14$)

CBSE Sample Paper 2016

13. A well of diameter 4 m is dug 14 m deep. The earth taken out is spread evenly all around the well to form a 40 cm high embankment. Find the width of the embankment.

CBSE 2015, Delhi (30/1/1)

14. Water is flowing at the rate of 2.52 km/h through a cylindrical pipe into a cylindrical tank, the radius of whose base is 40 cm . If the increase in the level of water in the tank, in half an hour is 3.15 m , find the internal diameter of the pipe.

CBSE 2015, Delhi (30/1/1)

15. A vessel full of water is in the form of an inverted cone of height 8 cm and the radius of its top, which is open, is 5 cm. 100 spherical lead balls are dropped into the vessel. One-fourth of the water flows out of the vessel. Find the radius of a spherical ball.

CBSE 2015, Foreign (30/2/1)

16. Milk in a container, which is in the form of a frustum of a cone of height 30 cm and the radii of whose lower and upper circular ends are 20 cm and 40 cm respectively, is to be distributed in a camp for flood victims. If this milk is available at the rate of ₹ 35 per litre and 880 litres of milk is needed daily for a camp, find how many such containers of milk are needed for a camp and what cost will it put on the donor agency for this. What value is indicated through this by the donor agency? **CBSE 2015, Foreign (30/2/1)**

17. 150 spherical marbles, each of diameter 1.4 cm, are dropped in a cylindrical vessel of diameter 7 cm containing some water, which are completely immersed in water. Find the rise in the level of water in the vessel.

CBSE 2014, Outside Delhi (30/1), (30/2), (30/3)

18. A container open at the top, is in the form of a frustum of a cone of height 24 cm with radii of its lower and upper circular ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at the rate of ₹ 21 per litre. [Use $\pi=22/7$]

CBSE 2014, Outside Delhi (30/1), (30/2) (30/3)

19. Water is flowing through a cylindrical pipe, of internal diameter 2 cm, into a cylindrical tank of base radius 40 cm, at the rate of 0.4 m/s. Determine the rise in level of water in the tank in half an hour.

CBSE 2013, Delhi (30/1/1)

20. A bucket open at the top, and made up of a metal sheet is in the form of a frustum of a cone. The depth of the bucket is 24 cm and the diameters of its upper and lower circular ends are 30 cm and 10 cm respectively. Find the cost of metal sheet used in it at the rate of Rs. 10 per 100 cm². [Use $\pi=3.14$]

CBSE 2013, Delhi (30/1/1)

21. A solid is in the shape of a cone surmounted on a hemisphere, the radius of each of them being 3.5 cm and the total height of solid is 9.5 cm. Find the volume of the solid. [Use $\pi=22/7$].

CBSE 2012, Delhi (30/1/1)

22. A bucket is in the form of a frustum of a cone and it can hold 28.49 litres of water. If the radii of its circular ends are 28 cm and 21 cm, find the height of the bucket. [Use $\pi=22/7$].

CBSE 2012, Delhi (30/1/1)

23. A toy is in the shape of a cone mounted on a hemisphere of same base radius. If the volume of the toy is 231 cm³ and its diameter is 7 cm, then find the height of the toy. [Use $\pi=22/7$]

CBSE 2012, Foreign (30/2/1)

24. The radii of internal and external surface of a hollow spherical shell are 3 cm and 5 cm respectively. It is melted and recast into a solid cylinder of diameter 14 cm. Find the height of the cylinder.

CBSE 2012, Foreign (30/2/1)

25. A drinking glass is in the shape of a frustum of a cone of height 14 cm. The diameters of its two circular ends are 16 cm and 12 cm. Find the capacity of the glass. [Use $\pi=22/7$]

CBSE 2012, Foreign (30/2/1)

26. A hemispherical tank, full of water, is emptied by a pipe at the rate of 257 litres per sec. How much time will it take to empty half the tank if diameter of the base of the tank is 3 m?

CBSE 2012, Outside Delhi (30/1)

27. A drinking glass is in the shape of the frustum of a cone of height 14 cm . The diameters of its two circular ends are 4 cm and 2 cm . Find the capacity of the glass. [Use $\pi=22/7$].
CBSE 2012, Outside Delhi (30/1)
28. A military tent of height 8.25 m is in the form of a right circular cylinder of base diameter 30 m and height 5.5 m surmounted by a right circular cone of same base radius. Find the length of the canvas used in making the tent, if the breadth of the canvas is 1.5 m .
CBSE 2012, Outside Delhi (30/1)
29. From a solid cylinder whose height is 15 cm and diameter 16 cm , a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid. [Take $\pi=3.14$]
CBSE 2011, Delhi (30/1/1)
30. Water is flowing at the rate of 6 km/h through a pipe of diameter 14 cm into a rectangular tank which is 60 m long and 22 m wide. Determine the time in which the level of the water in the tank will rise by 7 cm . [Use $\pi=22/7$]
CBSE 2011, Foreign (30/2/1)
31. A hollow sphere of internal and external diameters 4 cm and 8 cm respectively is melted to form a cone of base diameter 8 cm . Find the height and the slant height of the cone.
CBSE 2011, Foreign (30/2/1)
32. Water is flowing at the rate of 15 km/hour through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm ?
CBSE 2011, Outside Delhi (30/1)



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Authors speech :

Dear students/teachers/parents, this is prepared by me on the basis of CBSE old question papers. From 2018-19 onwards there is no difference between CBSE & our state syllabus. Use all the problems above to solve, you may get 70-75 marks out of 80 in board exam. This is also helpful for CBSE students. Don't compare state and central syllabus, because both are same.

MMDRS, SIRA