

3. b, c ve d birer gerçel sayı olmak üzere,

- $x^2 + bx + 2c = 0$ denkleminin kökleri x_1 ve x_2 dir.
- $x^2 + dx + 3c = 0$ denkleminin kökleri x_1 ve x_3 tür.

$\lim_{x \rightarrow x_1} \frac{x^2 + bx + 2c}{x^2 + dx + 3c} = \frac{1}{2}$

olduğuna göre, $\frac{b}{d}$ kaçtır?

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{5}{6}$ E) $\frac{6}{7}$

$$\frac{(x-x_1)(x-x_2)}{(x-x_1)(x-x_3)} = \frac{0}{0} \Rightarrow \lim_{x \rightarrow x_1} \frac{x-x_2}{x-x_3} = \frac{1}{2}$$

$$\Rightarrow \frac{x_1 - x_2}{x_1 - x_3} = \frac{1}{2}$$

$$2x_1 - 2x_2 = x_1 - x_3$$

$$x_1 = 2x_2 - x_3$$

$$\begin{matrix} \downarrow & & \downarrow \\ 2k & & 3k \end{matrix}$$

$$x_1 = k$$

$$\left. \begin{matrix} x_1 x_2 = 2c \\ x_1 x_3 = 3c \end{matrix} \right\} \Rightarrow \frac{x_2}{x_3} = \frac{2k}{3k}$$

$$x_2 = 2k$$

$$x_3 = 3k$$

$$x_1 + x_2 = -b \Rightarrow k + 2k = -b$$

$$x_1 + x_3 = -d \Rightarrow k + 3k = -d$$

$$\left. \begin{matrix} 3k = -b \\ 4k = -d \end{matrix} \right\} \Rightarrow \frac{b}{d} = \frac{3}{4}$$