

Menentukan Fungsi Kuadrat Jika Diketahui Titik Potong dg Sb-X (2)

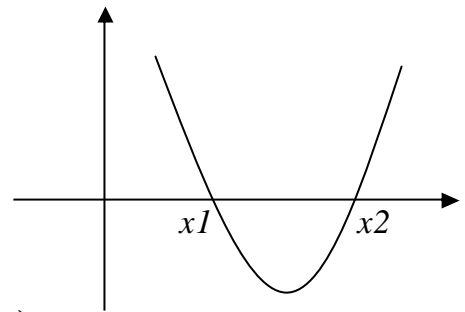
Misalkan fungsi kuadrat $y = f(x) = ax^2 + bx + c$ memotong sumbu-X di titik $(x_1, 0)$ dan $(x_2, 0)$, maka kedua titik tersebut memenuhi persamaan $y = ax^2 + bx + c$ sehingga $0 = ax_1^2 + bx_1 + c$ dan $0 = ax_2^2 + bx_2 + c$.

$$0 = ax_1^2 + bx_1 + c$$

$$0 = ax_2^2 + bx_2 + c$$

$$\frac{0 = ax_2^2 + bx_2 + c}{0 = a(x_1^2 - x_2^2) + b(x_1 - x_2)}$$

$$\Rightarrow b = \frac{-a(x_1^2 - x_2^2)}{(x_1 - x_2)} = -\frac{a(x_1 - x_2)(x_1 + x_2)}{(x_1 - x_2)} = -a(x_1 + x_2)$$



substitusi b ke $0 = ax_1^2 + bx_1 + c \Rightarrow 0 = ax_1^2 - a(x_1 + x_2)x_1 + c$

$$\Rightarrow 0 = ax_1^2 - ax_1^2 - ax_1x_2 + c$$

$$\Rightarrow 0 = -ax_1x_2 + c$$

$$\Rightarrow c = ax_1x_2$$

substitusi b dan c ke $y = ax^2 + bx + c \Rightarrow y = ax^2 - a(x_1 + x_2)x + ax_1x_2$

$$\Rightarrow y = a(x^2 - (x_1 + x_2)x + x_1x_2)$$

$$\Rightarrow y = a(x - x_1)(x - x_2)$$

Jadi, $y = a(x - x_1)(x - x_2)$ adalah fungsi kuadrat yang grafiknya memotong sumbu-X di titik $(x_1, 0)$ dan $(x_2, 0)$.

