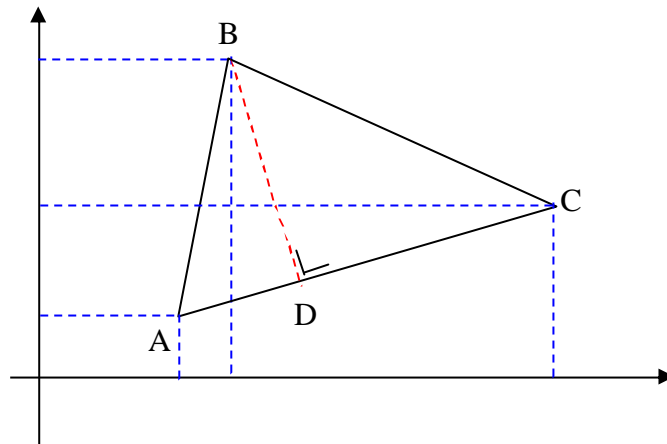


Luas Segitiga pada Bidang Koordinat (2)



Telah dibahas bahwa luas segitiga dgn titik-titik sudut $A(x_1, y_1)$, $B(x_2, y_2)$, dan $C(x_3, y_3)$ adalah:

$$L = \frac{1}{2} \left| (y_3 - y_1)(x_2 - x_1) - (x_3 - x_1)(y_2 - y_1) \right|$$

Dari rumus di atas, jika diuraikan akan kita peroleh:

$$\begin{aligned} L &= \frac{1}{2} \left| (y_3 - y_1)(x_2 - x_1) - (x_3 - x_1)(y_2 - y_1) \right| \\ &= \frac{1}{2} \left| x_2 y_3 - x_1 y_3 - x_2 y_1 + x_1 y_1 - x_3 y_2 + x_3 y_1 + x_1 y_2 + x_1 y_1 \right| \\ &= \frac{1}{2} \left| (x_1 y_2 + x_3 y_1 + x_2 y_3) - (x_3 y_2 + x_1 y_3 + x_2 y_1) \right| \end{aligned}$$

Misalkan $A = \begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$, maka $\det(A) = \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

$$= (x_1 y_2 + x_3 y_1 + x_2 y_3) - (x_3 y_2 + x_1 y_3 + x_2 y_1)$$

Jadi, $L = \pm \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

Ket:

Luas selalu bernilai **positif**, tanda \pm mengikuti nilai determinan matriknya.

(tidak berarti ada 2 nilai)