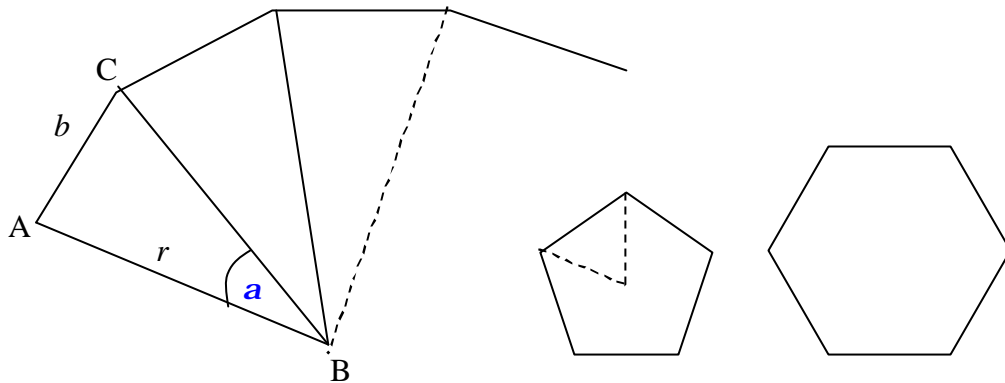


Luas Segi- n Beraturan



Berdasarkan aturan kosinus

$$\begin{aligned}
 AC^2 &= AB^2 + BC^2 - 2AB \cdot BC \cos B \Rightarrow b^2 = r^2 + r^2 - 2 \cdot r \cdot r \cdot \cos a \\
 &\Rightarrow b^2 = 2r^2 - 2r^2 \cos a \\
 &\Rightarrow b^2 = r^2 (2 - 2\cos a) \\
 &\Rightarrow r^2 = \frac{b^2}{2 - 2\cos a} \quad \dots\dots\dots (1)
 \end{aligned}$$

Luas segitiga ABC adalah

$$\begin{aligned}
 L &= \frac{1}{2} \cdot AB \cdot BC \cdot \sin B \\
 &= \frac{1}{2} \cdot r \cdot r \cdot \sin a \\
 &= \frac{1}{2} \cdot r^2 \cdot \sin a \quad \dots\dots\dots (2)
 \end{aligned}$$

Substitusi persamaan (1) ke persamaan (2)

$$\begin{aligned}
 L &= \frac{1}{2} \cdot r^2 \cdot \sin a \\
 &= \frac{1}{2} \frac{b^2}{2 - 2\cos a} \sin a \\
 &= \frac{1}{4} \frac{b^2 \cdot \sin a}{1 - \cos a}
 \end{aligned}$$

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$$L = \frac{\frac{1}{4} b^2 \cdot 2 \sin \frac{1}{2} a \cos \frac{1}{2} a}{1 - \left(1 - 2 \sin^2 \frac{1}{2} a \right)}$$

(lihat rumus sudut rangkap)

$$= \frac{\frac{1}{4} b^2 \cdot 2 \sin \frac{1}{2} a \cos \frac{1}{2} a}{2 \sin^2 \frac{1}{2} a}$$

$$= \frac{\frac{1}{4} b^2 \cdot \cos \frac{1}{2} a}{\sin \frac{1}{2} a}$$

$$= \frac{1}{4} b^2 \cdot \cot \frac{1}{2} a$$

$$= \frac{1}{4} b^2 \cdot \cot \frac{p}{n} \quad \left(\text{besar sudut } B \text{ adalah } a = \frac{2p}{n} \text{ maka } \frac{1}{2} a = \frac{p}{n} \right)$$

Karena segi- n beraturan terdiri dari n buah segitiga ABC, maka

$$L_{sg-n} = n \cdot L$$

$$= \frac{1}{4} n b^2 \cdot \cot \frac{p}{n}$$

$$= \frac{1}{4} n b^2 \cdot \frac{\cos \frac{p}{n}}{\sin \frac{p}{n}}$$

Rumus Luas Segi-n Beraturan