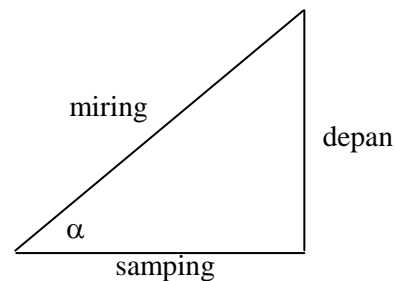
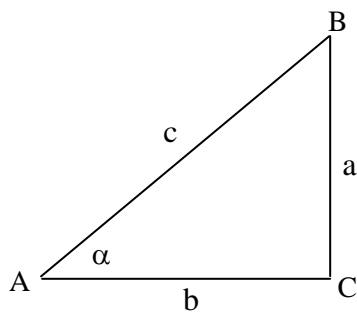


# PERBANDINGAN DAN FUNGSI TRIGONOMETRI

## B. Perbandingan-Perbandingan Trigonometri

Perhatikan segitiga siku-siku ABC disamping. Dengan titik sudut siku-siku di C. Panjang sisi dihadapan sudut A ( sisi depan) dinamakan a atau Panjang sisi dihadapan sudut B ( sisi samping) dinamakan b atau Panjang sisi dihadapan sudut C ( sisi miring) dinamakan c atau



Yang dimaksud nilai perbandingan dalam trigonometri adalah enam nilai perbandingan sisi sisi segitiga siku-siku, yaitu :

$$\sin \alpha = \frac{a}{c} = \frac{\text{sisi depan}}{\text{sisi miring}}$$

$$\operatorname{cosec} \alpha = \frac{c}{a} = \frac{\text{sisi miring}}{\text{sisi depan}}$$

$$\cos \alpha = \frac{b}{c} = \frac{\text{sisi samping}}{\text{sisi miring}}$$

$$\sec \alpha = \frac{c}{b} = \frac{\text{sisi miring}}{\text{sisi samping}}$$

$$\tan \alpha = \frac{a}{b} = \frac{\text{sisi depan}}{\text{sisi samping}}$$

$$\operatorname{cotan} \alpha = \frac{b}{a} = \frac{\text{sisi samping}}{\text{sisi depan}}$$

Dari nilai perbandingan di atas terdapat beberapa hubungan satu sama lain, yaitu

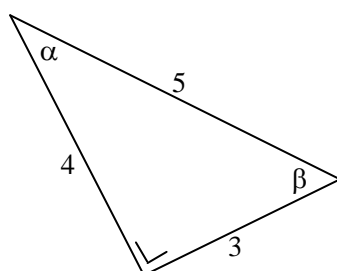
$$\operatorname{cosec} \alpha = \frac{1}{\sin \alpha}$$

$$\sec \alpha = \frac{1}{\cos \alpha}$$

$$\operatorname{cotan} \alpha = \frac{1}{\tan \alpha}$$

Untuk lebih jelasnya, ikutilah contoh soal berikut ini :

01. Dari segitiga siku-siku disamping tentukanlah nilai dari :



(a)  $\sin \alpha$

(b)  $\cos \alpha$

(c)  $\tan \alpha$

(d)  $\sin \beta$

(d)  $\tan \beta$

(e)  $\operatorname{csc} \beta$

Jawab

$$(a) \sin \alpha = \frac{\text{depan}}{\text{miring}} = \frac{3}{5}$$

$$(b) \cos \alpha = \frac{\text{samping}}{\text{miring}} = \frac{4}{5}$$

$$(c) \tan \alpha = \frac{\text{depan}}{\text{samping}} = \frac{3}{4}$$

$$(b) \sin \beta = \frac{\text{depan}}{\text{miring}} = \frac{4}{5}$$

$$(c) \tan \beta = \frac{\text{depan}}{\text{samping}} = \frac{4}{3}$$

$$(d) \csc \beta = \frac{\text{samping}}{\text{depan}} = \frac{5}{4}$$

02. Jika koordinat A(8,4) dan  $\alpha$  adalah sudut antara OA dan sumbu X, maka tentukanlah nilai :

(a)  $\sin \alpha$

(b)  $\tan \alpha$

(c)  $\sec \alpha$

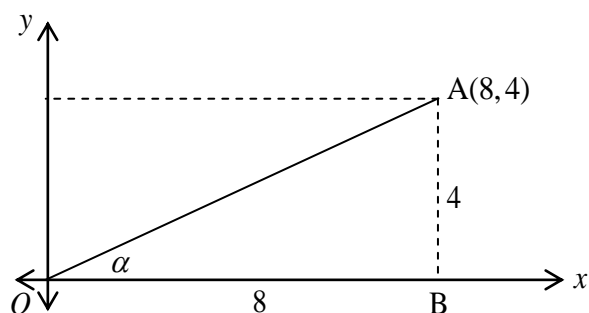
Jawab

$$OA^2 = OB^2 + AB^2$$

$$OA^2 = 8^2 + 4^2$$

$$OA^2 = 80$$

$$OA = \sqrt{80} = 4\sqrt{5}$$



$$(a) \sin \alpha = \frac{AB}{OA} = \frac{4}{4\sqrt{5}} = \frac{4}{4\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$(b) \tan \alpha = \frac{AB}{OB} = \frac{4}{8} = \frac{1}{2}$$

$$(c) \sec \alpha = \frac{OA}{OB} = \frac{4\sqrt{5}}{8} = \frac{\sqrt{5}}{2}$$

03. Diketahui segitiga ABC siku-siku di B, dimana  $AB = \sqrt{12}$  cm dan  $AC = 4$  cm. Tentukanlah nilai

(a)  $\cos A$

(b)  $\tan C$

(c)  $\csc A$

Jawab

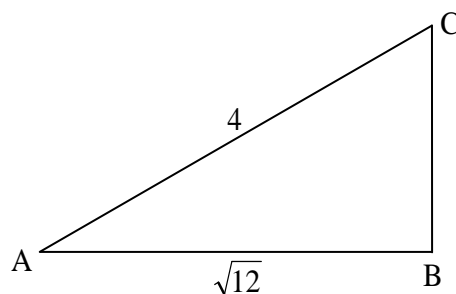
$$BC^2 = AC^2 - AB^2$$

$$BC^2 = 4^2 - (\sqrt{12})^2$$

$$BC^2 = 16 - 12$$

$$BC^2 = 4$$

$$BC = 2$$



maka

$$(a) \cos A = \frac{AB}{AC} = \frac{\sqrt{12}}{4} = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$(b) \tan C = \frac{AB}{BC} = \frac{\sqrt{12}}{2} = \frac{2\sqrt{3}}{2} = \sqrt{3}$$

$$(c) \csc A = \frac{AC}{BC} = \frac{4}{2} = 2$$