

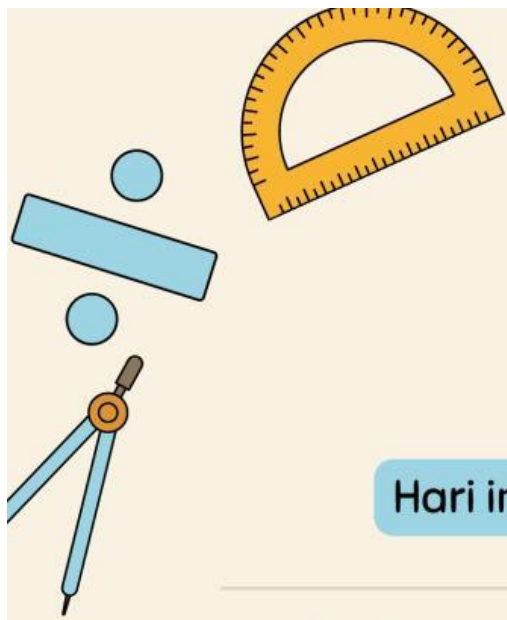
The background is a light beige color with various geometric shapes and tools scattered around. These include a ruler, a protractor, a compass, a set square, a large orange 'X', a blue set square, a yellow ruler, a blue ruler, a yellow protractor, and a blue set square. The shapes are drawn in a simple, cartoonish style with black outlines and some are filled with colors like orange, blue, and yellow.

LKPD

Lembar kerja peserta didik

TRIGONOMETRI

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Hari ini kita akan mempelajari :

Definisi rasio atau perbandingan trigonometri

- 1) Identitas trigonometri
- 2) Nilai-nilai rasio trigonometri pada sudut istimewa
- 3) Sudut-sudut berelasi
- 4)

RASIO TRIGONOMETRI

Selanjutnya rasio-rasio tersebut diberi nama yaitu:

Sinus (Sin)

$$\frac{\text{Depan}}{\text{Miring}}$$

Cosinus (Cos)

$$\frac{\text{Samping}}{\text{Miring}}$$

Tangen (Tan)

$$\frac{\text{Depan}}{\text{Samping}}$$

Kebalikan dari rasio-rasio trigonometri adalah sebagai berikut

Cosecan (Csc)

$$\frac{\text{Miring}}{\text{Depan}}$$

Secan (Sec)

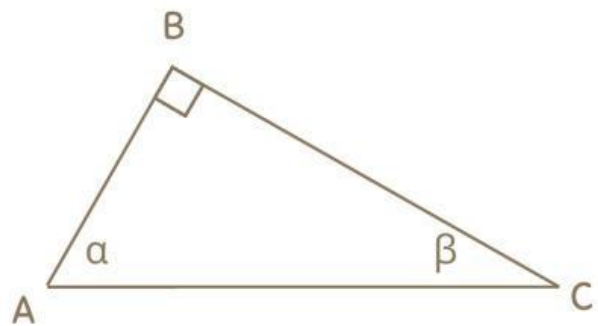
$$\frac{\text{Miring}}{\text{Samping}}$$

Cotangen (Cot)

$$\frac{\text{Samping}}{\text{Depan}}$$

Contoh

Tentukan keenam rasio trigonometri untuk sudut β , jika diketahui panjang $AB = 5\text{cm}$, dan panjang $BC = 12\text{cm}$

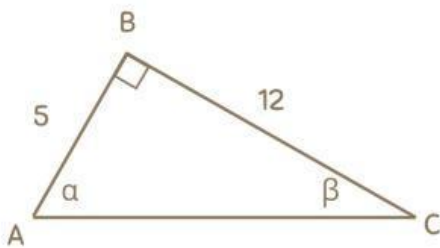


Jawab

Menggunakan teorema Pythagoras:

$$\begin{aligned}AC^2 &= 5^2 + 12^2 \\&= 25 + 144 \\&= 169\end{aligned}$$

$$AC = \sqrt{169} = 13$$



Rasio trigonometri untuk $\angle \beta$

$$\sin \beta = \frac{5}{13} \qquad \csc \beta = \frac{13}{5}$$

$$\cos \beta = \frac{12}{13} \qquad \sec \beta = \frac{13}{12}$$

$$\tan \beta = \frac{5}{12} \qquad \cot \beta = \frac{12}{5}$$



IDENTITAS TRIGONOMETRI

Sifat kebalikan rasio trigonometri dapat dituliskan sebagai persamaan-persamaan berikut

Identitas Kebalikan

1.

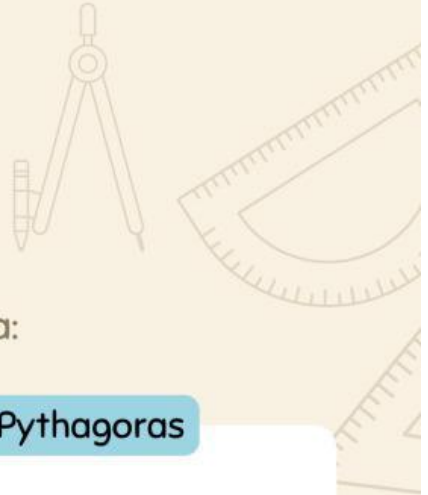
$$\csc \alpha = \frac{1}{\sin \alpha}$$

2.

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

3.

$$\cot \alpha = \frac{1}{\tan \alpha}$$



Beberapa identitas lain yang sering digunakan diantaranya:

Identitas Tangen dan cotangen

1. $\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$

2. $\cot \alpha = \frac{\cos \alpha}{\sin \alpha}$

Identitas Pythagoras

1. $\sin^2 \alpha + \cos^2 \alpha = 1$

2. $1 + \cot^2 \alpha = \csc^2 \alpha$

3. $\tan^2 \alpha + 1 = \sec^2 \alpha$

Contoh

Buktikan bahwa persamaan di bawah ini benar!

$$\frac{2 - \sec^2 \theta}{\sec^2 \theta} = \cos^2 \theta - \sin^2 \theta$$

Jawab

$$\begin{aligned}\frac{2 - \sec^2 \theta}{\sec^2 \theta} &= \frac{2}{\sec^2 \theta} - \frac{\sec^2 \theta}{\sec^2 \theta} \\ &= \frac{2}{\sec^2 \theta} - 1 \\ &= 2\left(\frac{1}{\sec \theta}\right)^2 - 1\end{aligned}$$

$$\begin{aligned}&= 2(\cos \theta)^2 - 1 \\ &= 2\cos^2 \theta - (\sin^2 \theta + \cos^2 \theta) \\ &= 2\cos^2 \theta - \sin^2 \theta - \cos^2 \theta \\ &= \cos^2 \theta - \sin^2 \theta\end{aligned}$$



SUDUT-SUDUT ISTIMEWA

Sudut-sudut istimewa diantaranya adalah: 0° , 30° , 45° , 60° , dan 90° .

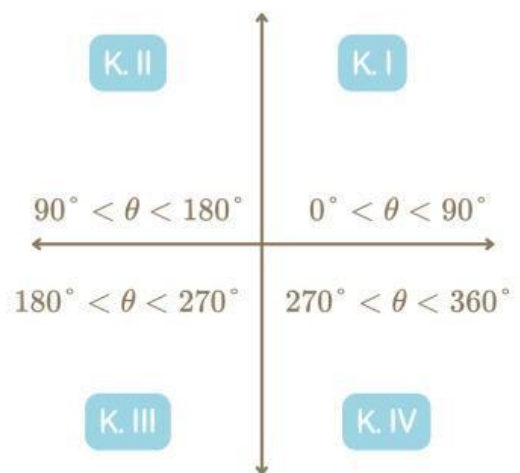
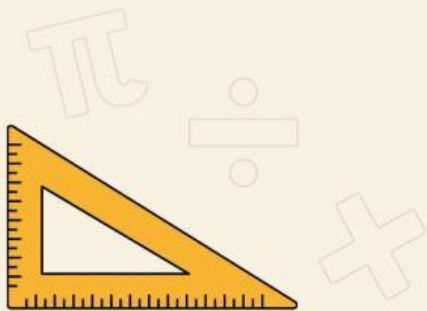
Nilai-nilai rasio trigonometri untuk sudut istimewa:

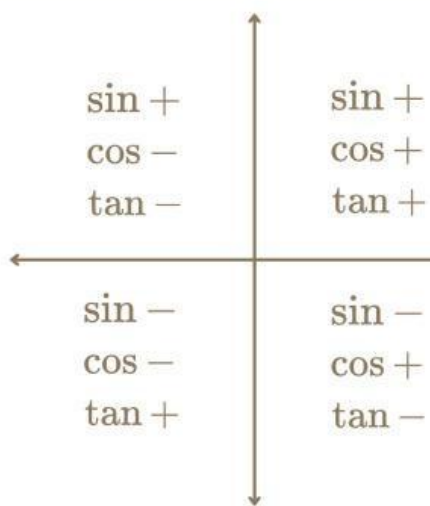


	0°	30°	45°	60°	90°
Sin	0	$\frac{1}{2}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}\sqrt{3}$	1
Cos	1	$\frac{1}{2}\sqrt{3}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}$	0
Tan	0	$\frac{1}{3}\sqrt{3}$	1	$\sqrt{3}$	tidak terdefinisi

SUDUT-SUDUT BERELASI

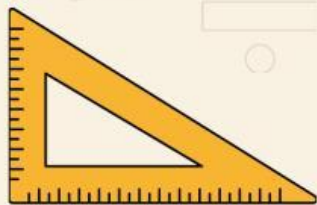
Sudut-sudut berelasi merupakan sudut di kuadran II, III, dan IV, yang nilai rasio trigonometri-nya bersesuaian dengan sudut-sudut pada kuadran I.





sin + cos - tan -	sin + cos + tan +
sin - cos - tan +	sin - cos + tan -

Nilai rasio trigonometri di setiap kuadran tergantung pada nilai sumbu x dan sumbu y (positif atau negatif).



KUADRAN II

$$\sin (180^\circ - \theta) = \sin \theta$$

$$\cos (180^\circ - \theta) = -\cos \theta$$

$$\tan (180^\circ - \theta) = -\tan \theta$$

Contoh

Tentukan nilai $\cos 135^\circ$!

Jawab:

$$\begin{aligned}\cos 135^\circ &= \cos (180^\circ - 45^\circ) \\ &= -\cos 45^\circ \\ &= -\frac{1}{2}\sqrt{2}\end{aligned}$$

KUADRAN III

$$\sin (180^\circ + \theta) = -\sin \theta$$

$$\cos (180^\circ + \theta) = -\cos \theta$$

$$\tan (180^\circ + \theta) = \tan \theta$$

soal

Tentukan nilai $\tan 240^\circ$!

Jawab:

KUADRAN IV

$$\sin (360^\circ - \theta) = -\sin \theta$$

$$\cos (360^\circ - \theta) = \cos \theta$$

$$\tan (360^\circ - \theta) = -\tan \theta$$

SOAL

Tentukan nilai $\sin 330^\circ$!

Jawab:

