

The background is a light beige color. It is decorated with various geometric shapes and tools in blue and orange. At the top, there are faint outlines of a ruler, a protractor, a compass, and a set square. In the center, there is a blue rounded rectangle containing the text 'LKPD' and 'Lembar kerja peserta didik'. Below this, the word 'TRIGONOMETRI' is written in large, bold, orange letters with a black outline. Underneath that, 'BY : OLIVEA MECCA' is written in smaller, black, sans-serif capital letters. At the bottom, there are more geometric shapes: a blue set square, an orange ruler, a blue rectangle, two blue circles, and an orange protractor. In the bottom right corner, there is a logo for 'LIVEWORKSHEETS' with a small colorful icon to the left of the text.

LKPD

Lembar kerja peserta didik

TRIGONOMETRI

BY : OLIVEA MECCA

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)

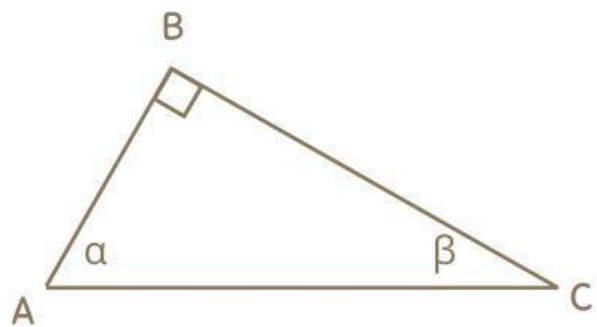
$$\frac{\text{Miring}}{\text{Samping}}$$

Cotangen (Cot)

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

Contoh

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

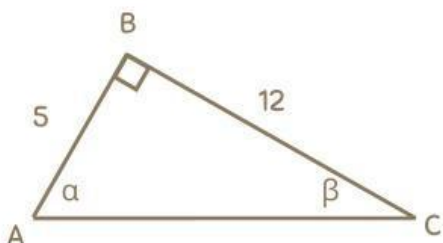


Jawab

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

Bukti:

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

$$= \frac{2}{\sec^2 \theta} - 1$$

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

$$= 2(\cos \theta)^2 - 1$$

$$= 2\cos^2 \theta - (\sin^2 \theta + \cos^2 \theta)$$

$$= 2\cos^2 \theta - \sin^2 \theta - \cos^2 \theta$$

$$= \cos^2 \theta - \sin^2 \theta$$



SUDUT-SUDUT ISTIMEWA

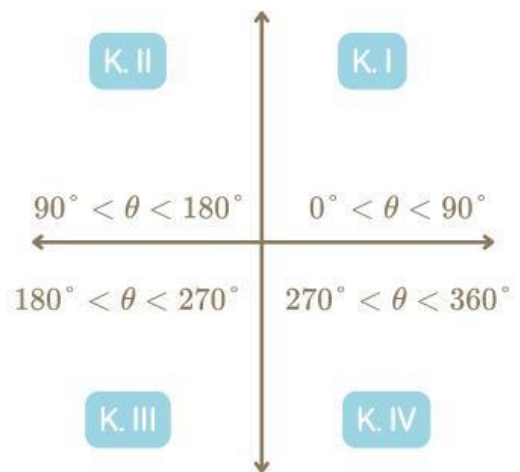
Sudut-sudut istimewa diantaranya adalah: 0° , 30° , 45° , 60° , dan 90° .
Nilai-nilai rasio trigonometri untuk sudut istimewa:

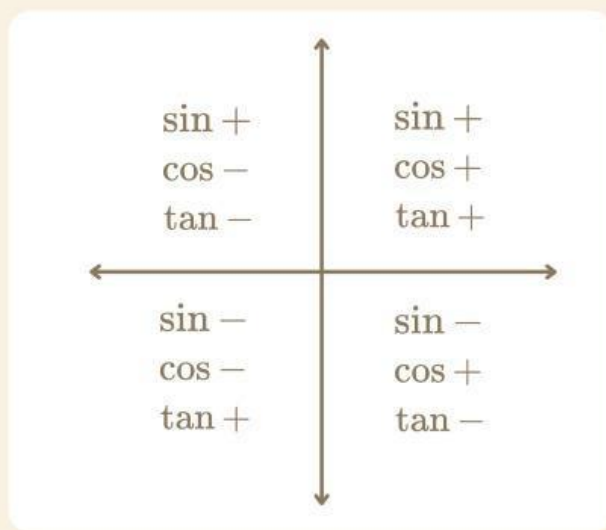


	0°	30°	45°	60°	90°
Sin	0	$\frac{1}{2}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}\sqrt{3}$	1
Cos	1	$\frac{1}{2}\sqrt{3}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}$	0
Tan	0	$\frac{1}{3}\sqrt{3}$	1	$\sqrt{3}$	tidak terdefinisi

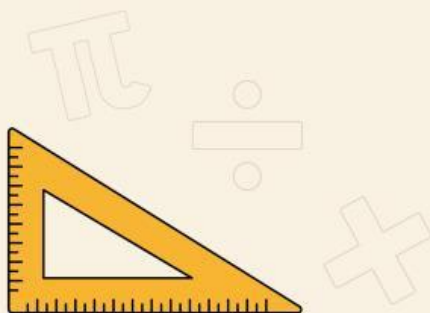
SUDUT-SUDUT BERELASI

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





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:

