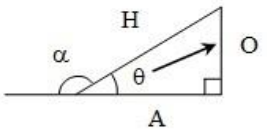
Trigonometri

(20) TRIGONOMETRI - TRIGONOMETRY I / II

(a) NISBAH TRIGONOMETRI (Trigonometrical ratios)



MUDAH HAFAL

$\sin\theta = \frac{O}{H}$ SOH

$\cos\theta = \frac{A}{H}$ KAH

$\tan\theta = \frac{O}{A}$ TOA

$\sin\alpha = \frac{O}{H}$

$\cos\alpha = -\frac{A}{H}$

$\tan\alpha = -\frac{O}{A}$

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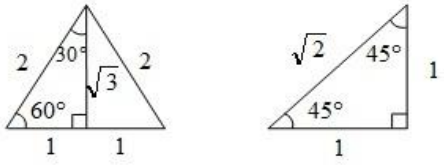
(b) NISBAH NILAI TRIGO, SUDUT ISTIMEWA
The values of trigonometric ratios of 30°, 45°, and 60° (Special angles)

θ	sin θ	cos θ	tan θ
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45°	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$



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(c) NILAI TRIKONOMETRI DALAM KUADRANT
The value of sine, cosine and tangent, of an angle

Di dalam unit bulatan (In a unit circle),

$\Rightarrow \sin\theta$ = nilai koordinat-y

$\Rightarrow \cos\theta$ = nilai koordinat-x

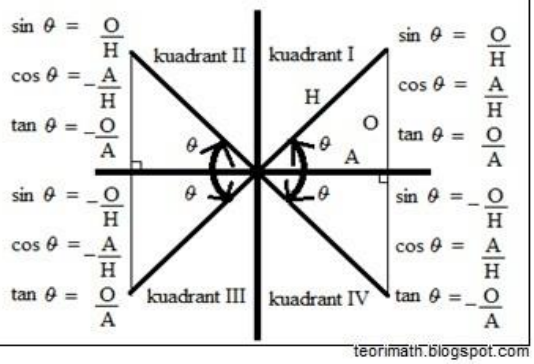
$$\Rightarrow \tan\theta = \frac{\text{nilai koordinat-}y}{\text{nilai koordinat-}x} = \frac{\textit{the value of coordinate} - y}{\textit{the value of coordinate} - x} = \frac{\sin\theta}{\cos\theta}$$

Teknik menghafal (lihat nilai yang positif)

S	A
T	C

ASTC
All Tan
Sin Cos

Quadrant 2	***Quadrant 1***
$90° < \theta < 180°$	$0° < \theta < 90°$
$\Rightarrow \sin\theta$ +if	$\Rightarrow \sin\theta$ +if
$\Rightarrow \cos\theta$ −if	$\Rightarrow \cos\theta$ +if
$\Rightarrow \tan\theta$ −if	$\Rightarrow \tan\theta$ +if
Quadrant 3	***Quadrant 4***
$180° < \theta < 270°$	$270° < \theta < 360°$
$\Rightarrow \sin\theta$ −if	$\Rightarrow \sin\theta$ −if
$\Rightarrow \cos\theta$ −if	$\Rightarrow \cos\theta$ +if
$\Rightarrow \tan\theta$ +if	$\Rightarrow \tan\theta$ −if



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(d) MENCARI NILAI SUDUT diberi nilai sin, kos dan tan
(Finding the angles, given the value of sine, cosine and tangent)

Quadrant	Angle
KUADRANT I	θ, from calculator
KUADRANT II	180 − θ
KUADRANT III	180 + θ
KUADRANT IV	360 − θ

Contoh 1 :

$\sin x = 0.5299,\ 0° \le x \le 360° \Rightarrow x = ???$

$\sin x$ +if, $x \Rightarrow$ I, II

$\sin \underline{32°} = 0.5299$ (kalkulator saintifik)

$x = 32°,\ 148°$

Contoh 2 :

$\cos x = -0.7721,\ 0° \le x \le 360° \Rightarrow x = ???$

$\cos x$ −if, $x \Rightarrow$ II, III

$\cos \underline{39.46°} = 0.7721$ (kalkulator saintifik)

$x = 140.54°,\ 219.46°$

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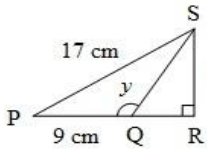
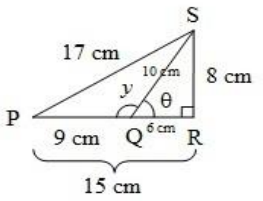
(f) PENYELESAIAN MASALAH (Solve problem involving sine, cosine and tangent)

Contoh 1 :



$\Rightarrow \cos y = ???$

⇓ jawapan ⇓

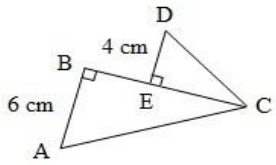


$\cos y = -\cos\theta$

$= -\frac{6}{10}$

$= -\frac{3}{5}$

Contoh 2 :



$\Rightarrow \tan \angle BCA = \frac{3}{4}$,

$\sin \angle ECD = \frac{4}{5}$

$BE = ???$

⇓ jawapan ⇓

$\tan \angle BCA = \frac{3}{4}$ $\qquad$ $\sin \angle ECD = \frac{4}{5}$

$\frac{6}{BC} = \frac{3}{4}$ $\qquad$ $\frac{4}{CD} = \frac{4}{5}$

$BC = 8$ $\qquad$ $CD = 5$

$\therefore EC = 3,\ BE = 8 - 3 = 5$

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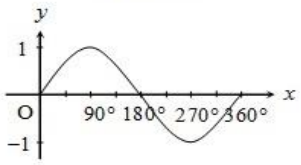
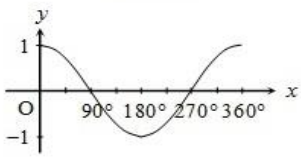
(g) GRAF SIN, KOS, TAN untuk sudut 0 hingga 360
(Compare and differentiate the graph of sine, cosine and tangent for angle between $0° \le x \le 360$)

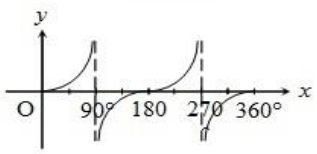
$y = \sin x$



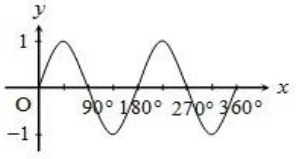
$y = \cos x$



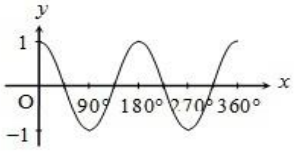
$y = \tan x$



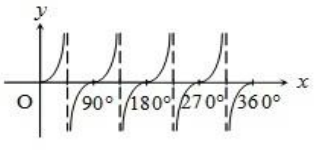
$y = \sin 2x$



$y = \cos 2x$



$y = \tan 2x$



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