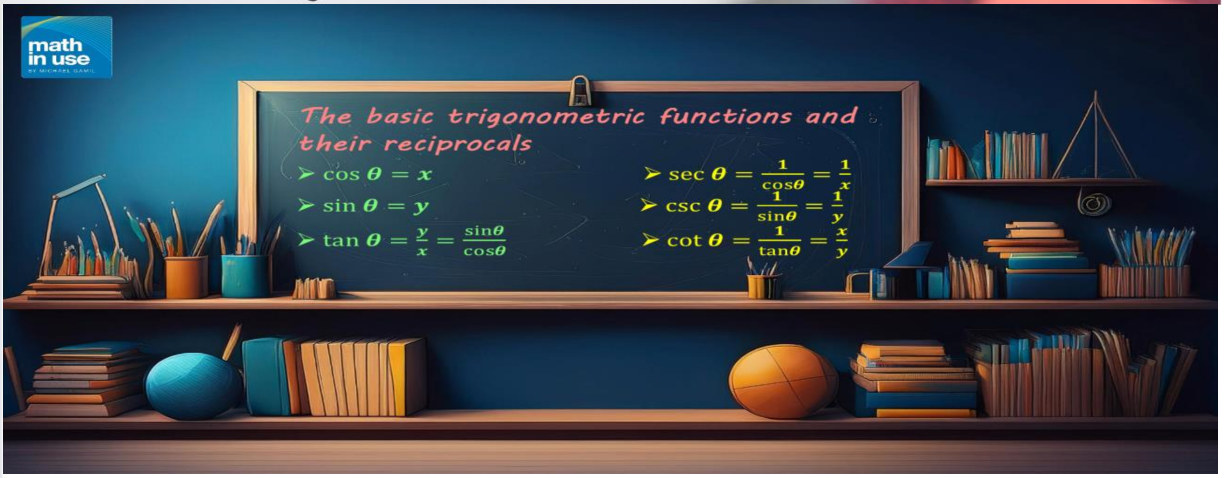


Trigonometric functions

Choose the correct answer

If θ is the measure of an angle in the standard position , its terminal side intersects the unit circle at the point $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$, then $\sin\theta =$ ....

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{2}{\sqrt{3}}$

If the terminal side of the angle whose measure θ drawn in the standard position intersect the unit circle at the point B $\left(\frac{-3}{5}, \frac{4}{5}\right)$, then cot θ = ...

(a) $\frac{5}{4}$ (b) $\frac{-5}{3}$ (c) $\frac{-4}{3}$ (d) – 0.75

$$\cot\theta = \frac{x}{y} = \frac{-3}{4} = -0.75$$

If θ is a directed angle in the standard position its terminal side intersect the unit circle at $\left(\overset{x}{\frac{-5}{13}}, \overset{y}{\frac{12}{13}}\right)$, then $\cos\theta - \sin\theta =$ ………

(a) $\frac{17}{13}$ (b) $\frac{7}{13}$ (c) $\frac{-7}{13}$ (d) $\frac{-17}{13}$

$$\cos\theta - \sin\theta = \frac{-5}{13} - \frac{12}{13} = \frac{-17}{13}$$

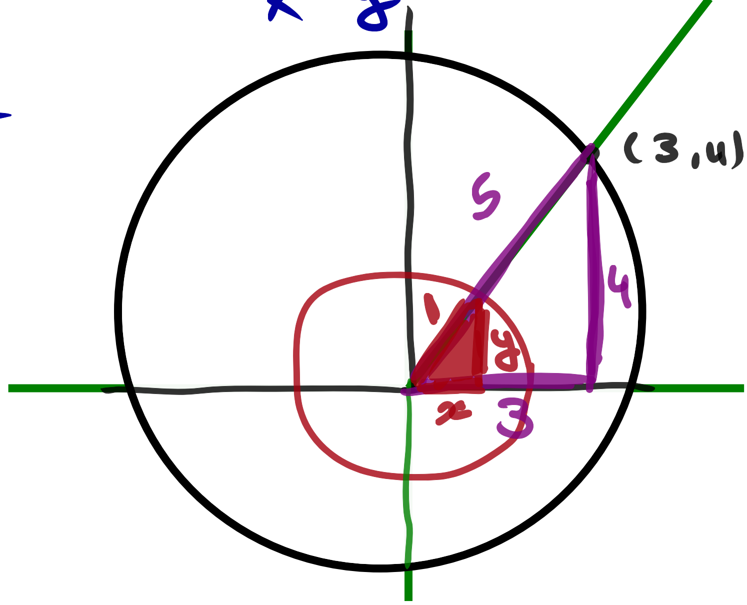
A directed angle in the standard position its terminal side passes through the point (3 , 4) then its initial side intersect the unit circle at the point …… (x, y)

~~(a)~~ (3 , 0) ~~(b)~~ (1 , 0) (c) (0.6 , 0.8) ~~(d)~~ $\left(\frac{4}{3}, \frac{5}{3}\right)$

$$\frac{x}{3} = \frac{y}{4} = \frac{1}{5}$$

$$x = \frac{3}{5} = 0.6$$

$$y = \frac{4}{5} = 0.8$$



If $\tan\theta = \frac{1}{2}$ where θ is an acute angle in standard position , then its terminal side intersects the unit circle at the point ....

(a) (2 , 1) (b) (1 , 2) (c) $\left(\frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}\right)$ (d) $\left(\frac{2}{\sqrt{5}}, \frac{1}{\sqrt{5}}\right)$

$\tan\theta = 2$ $\tan\theta = \frac{1}{2}$

If $\sin\theta = \frac{1}{\sqrt{2}}$, where θ is the measure of a positive acute angle ,

then the measure of angle θ = ...

(a) 30° (b) 60° (c) 45° (d) 90°

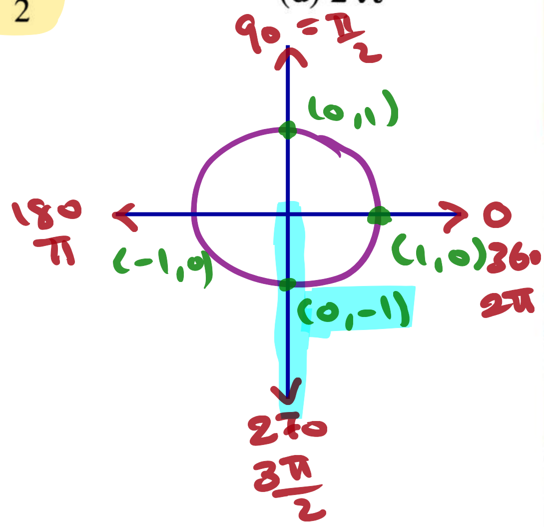
$$\sin\theta = \frac{1}{\sqrt{2}}$$

$$\theta = \sin^{-1}\left(\frac{1}{\sqrt{2}}\right) = 45^\circ$$

If $\sin \overset{y}{\theta} = -1$, $\cos \overset{x}{\theta} = 0$, then the measure of angle $\theta =$ ....

(a) $\frac{\pi}{2}$ (b) π (c) $\frac{3\pi}{2}$ (d) 2π

$(0, -1)$



If $\csc \theta = 2$, where θ is a positive acute angle , then the measure of angle $\theta =$ ....

(a) 15°   (b) 30°   (c) 45°   (d) 60°

$\csc\theta = 2 \Rightarrow \sin\theta = \frac{1}{2}$

$\theta = \sin^{-1}(\frac{1}{2}) = 30^\circ$

If $\tan\theta = 1$, where θ is a positive acute angle , then the measure of angle $\theta =$ ....

(a) 60°   (b) 30°   (c) 45°   (d) 90°

$\theta = \tan^{-1}(1) = 45°$

If $\cos\theta = \frac{1}{2}$, $\sin\theta = \frac{\sqrt{3}}{2}$, then the measure of angle $\theta =$ ....

(a) $\frac{\pi}{3}$ (b) $\frac{5\pi}{6}$ (c) $\frac{5\pi}{3}$ (d) $\frac{11\pi}{6}$

$\theta = \cos^{-1}\left(\frac{1}{2}\right) = 60 \times \frac{\pi}{180} = \frac{\pi}{3}$

If $\cos\theta = \frac{1}{2}$, $\sin\theta = \frac{-\sqrt{3}}{2}$, then $\tan\theta = \cdots\cdots\cdots$

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{-1}{2}$ (c) $\frac{-1}{\sqrt{3}}$ (d) $-\sqrt{3}$

$$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{-\sqrt{3}}{1} = -\sqrt{3}$$

S A
t C

If the terminal side of a directed angle in the standard position intersect the unit circle at the point $\left(\overset{x}{\frac{1}{2}}, \overset{y}{\frac{\sqrt{3}}{2}}\right)$, then the measure of this angle = ...

(a) 150° (b) 30° (c) 60° (d) 210°

$\cos\theta = \frac{1}{2} \Rightarrow \theta = \cos^{-1}\left(\frac{1}{2}\right) = 60$

$\sin\theta = \frac{\sqrt{3}}{2} \Rightarrow \theta = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = 60$

If $\cos\theta > 0$, $\sin\theta < 0$, then θ lies in the ·········· quadrant.

(a) first (b) second (c) third (d) fourth

$\cos\theta > 0 \Rightarrow (+ve)$

$\sin\theta < 0 \Rightarrow (-ve)$

If $\cos\theta = \frac{\sqrt{3}}{2}$, where θ is a positive acute angle, then $\sin\theta =$ ....

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{2}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

$$x^2 + y^2 = 1$$

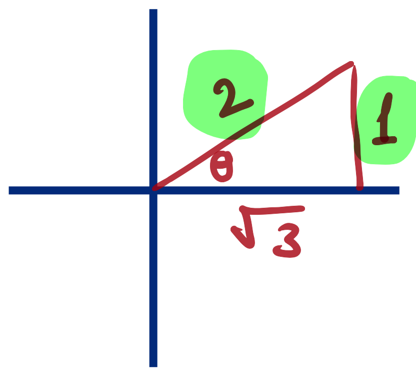
$$\left(\frac{\sqrt{3}}{2}\right)^2 + y^2 = 1$$

$$\frac{3}{4} + y^2 = 1$$

$$y^2 = \frac{1}{4}$$

$$y = \pm\sqrt{\frac{1}{4}}$$

$$y = \frac{1}{2} \qquad \cancel{y = -\frac{1}{2}}$$



If $\sin\theta = \frac{-1}{2}$, $\sec\theta = \frac{-2}{\sqrt{3}}$, then θ lies in the .... quadrant.

(a) first (b) second (c) third (d) fourth

$\sin\theta = \frac{-1}{2}$ $\cos\theta = -\frac{\sqrt{3}}{2}$

S	A
t	C

If $\sin\theta = \frac{-1}{2}$, $\cos\theta = \frac{\sqrt{3}}{2}$, then the angle whose measure θ lies in the ……… quadrant.

(a) first (b) second (c) third (d) fourth

S A

t $\boxed{C}$

If θ is measure of an angle lies in the third quadrant , which of the following is always true ?

(a) $\sin\theta \cos\theta < 0$ (b) $\sec\theta \csc\theta < 0$ (c) $\tan\theta \cot\theta < 0$ (d) $\sin\theta \tan\theta < 0$

(−)(+) = −ve < 0

(−)(−) +ve

(−)(−) +ve

(+)(+) +ve

S | A
t | C

2 sin 45° = ……… $2\left(\frac{\sqrt{2}}{2}\right) = \sqrt{2}$

(a) sin 90° (b) $\frac{\sqrt{2}}{2}$ (c) $\sqrt{2}$ (d) 2

$\cot^2 30° - \sec^2 60° + \csc^2 45° = \cdots\cdots\cdots$

(a) 1 (b) 0 (c) –1 (d) 2

$(3) - (4) + (2) = 1$

$\sin\left(-\frac{12}{5}\pi\right) = \text{.......}$ Sin 288

(a) $\sin \frac{12}{5}\pi$ (b) $\sin 72°$ (c) $\sin 288°$ (d) $\sin \frac{1}{5}\pi$

sin 0° + cos 0° + tan 0° = ... 0 + 1 + 0 = 1

(a) 0 (b) 1 (c) 2 (d) 3

$\cos^2 \frac{\pi}{4} - \sin^2 \frac{\pi}{4} = \dots\dots\dots$

~~(a)~~ $\cos^2 \pi = 1$ ~~(b)~~ $\sin^2 \frac{\pi}{2} = 1$ ~~(c)~~ $\cos \pi = -1$ (d) $\cos \frac{\pi}{2} = 0$

$(\cos 45)^2 - (\sin 45)^2$

$\left(\frac{1}{\sqrt{2}}\right)^2 - \left(\frac{1}{\sqrt{2}}\right)^2 = \text{Zero}$

$\cos\frac{\pi}{2}\cos 0 + \sin\frac{3\pi}{2}\sin\frac{\pi}{2} = \ldots\ldots$

$0 + (-1)(1)$

$0 - 1 = -1$

(a) zero (b) 1 (c) –1 (d) 2

0 + 1 + 0 + -1

$\sin 0° + \sin 90° + \sin 180° + \sin 270° = \dots 0 \dots$

(a) 4 (b) 2 (c) 3 (d) zero

$\cot^2 30° + 2\sin^2 45° + \cos^2 90° = \cdots\cdots\cdots$ 4

(a) zero (b) 3 (c) 4 (d) 2

$2 \sin 45° \cos 45° \cot 45° = \cdots$ $2\left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{\sqrt{2}}\right)(1) = 1$

(a) $\cos 60°$ (b) $2 \cos 30°$ (c) $2 \sin \frac{\pi}{6}$ (d) $\tan \pi$

$= \frac{1}{2}$ $= \sqrt{3}$ 1

$\sin 30° + \cos 60° - \cot 45° = \frac{1}{2} + \frac{1}{2} - 1 =$ Zero

(a) 2 (b) zero (c) $\sqrt{3} - \sqrt{2}$ (d) 1

$$\frac{\tan^2 60° - \tan^2 45°}{\sec^2 30° - \csc^2 45°} = \text{..........}$$

(a) zero (b) 3 (c) – 2 (d) – 3

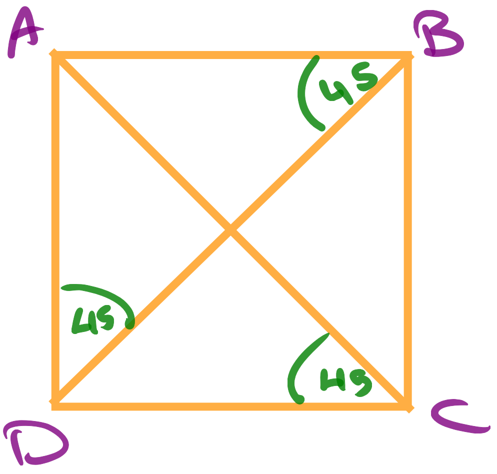
$$\frac{3 - 1}{\frac{4}{3} - 2} = -3$$

If ABCD is a square , then $\sin^2(\angle ACD) + \sin^2(\angle ABD) + \tan(\angle ADB) = \cdots\cdots\cdots$

(a) $\frac{3}{2}$ (b) 3 (c) 2 (d) $1+\sqrt{2}$

$\sin^2 45 + \sin^2 45 + \tan 45$

$\frac{1}{2} + \frac{1}{2} + 1 = 2$

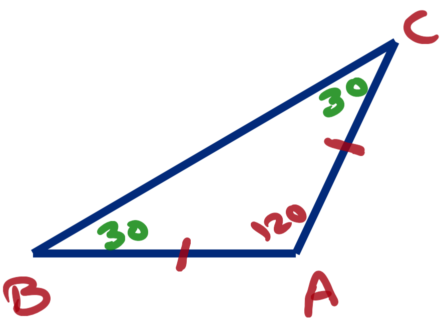


ABC is an isosceles triangle in which m (∠ A) = 120°
, then $\sin B + \cos^2 C =$ ....

(a) $1 + \sqrt{3}$ (b) $1\ \frac{1}{2}$ (c) $1\frac{2}{3}$ (d) $1\ \frac{1}{4}$

$\sin 30 + \cos^2 30$

$\frac{1}{2} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}$



If ABC is a right-angled triangle at B , m (∠ A) = 2 m (∠ C)

, then sec A + csc C = ……… sec 60 + csc 30 = 4

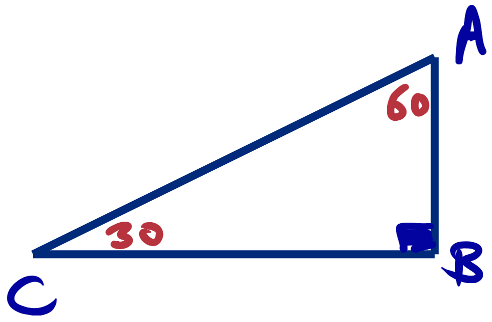
(a) 2 (b) 4 (c) 6 (d) 8

A + C = 90°

A : C : Sum

2 : 1 : 3

60° : 30 : 90°

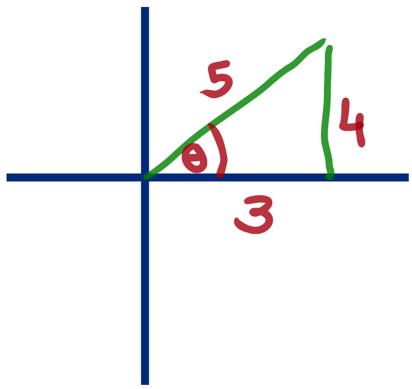


If $\theta \in]0, \frac{\pi}{2}[$, $\cos\theta = \frac{3}{5}$, then $\csc\theta \sin\theta - \tan\theta \csc\theta = \dots\dots\dots$

(a) zero (b) 1 (c) $\frac{-3}{2}$ (d) $\frac{-2}{3}$

$$\left(\frac{5}{4}\right)\left(\frac{4}{5}\right) - \left(\frac{\cancel{4}}{3}\right)\left(\frac{5}{\cancel{4}}\right)$$

$$1 - \frac{5}{3} = -\frac{2}{3}$$

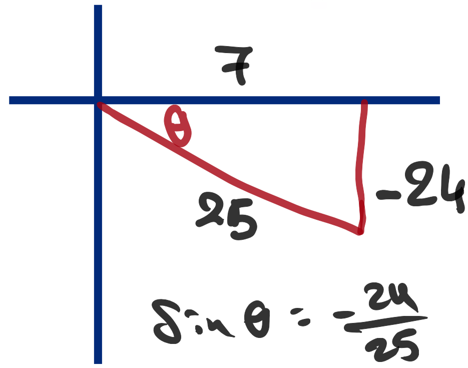


270, 360

If $\sin\theta = \frac{-24}{25}$, $\theta \in \left] \frac{3\pi}{2}, 2\pi \right[$, then $\frac{\sin\theta + \cos\theta}{\sin\theta} = \dots\dots\dots$

(a) $\frac{17}{24}$ (b) $\frac{-17}{24}$ (c) $\frac{24}{17}$ (d) $\frac{-24}{17}$

$$\frac{-\frac{24}{25} + \frac{7}{25}}{\frac{-24}{25}} = \frac{17}{24}$$



$\sin\theta = -\frac{24}{25}$

$\cos\theta = \frac{7}{25}$

If $x \in [0°, 90°]$ and $\cos x = \frac{\sin 60°}{\sin 90°} - \frac{\sin 0°}{\sin 45°}$, then $x = \dots\dots\dots$

(a) 30° (b) 60° (c) 0° (d) 90°

$$\cos x = \frac{\sqrt{3}/2}{1} - 0$$

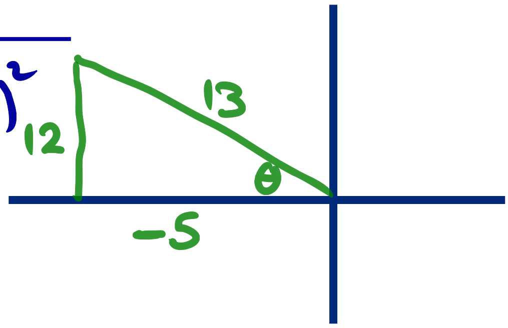
$$\cos x = \frac{\sqrt{3}}{2}$$

$$x = \cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = 30°$$

If $\theta \in \left]\overset{90}{\frac{\pi}{2}}, \overset{180}{\pi}\right[$, $\sin\theta = \frac{12}{13}$, then $\sqrt{\csc\theta \sin\theta - \tan\theta \cot\theta + \cos^2\theta} = \cdots\cdots\cdots$

(a) zero (b) $\frac{5}{13}$ (c) $\frac{4}{3}$ (d) $\frac{15}{26}$

$$\sqrt{\left(\frac{13}{12}\right)\left(\frac{12}{13}\right) - \left(\frac{12}{-5}\right)\left(\frac{-5}{12}\right) + \left(\frac{-5}{13}\right)^2}$$

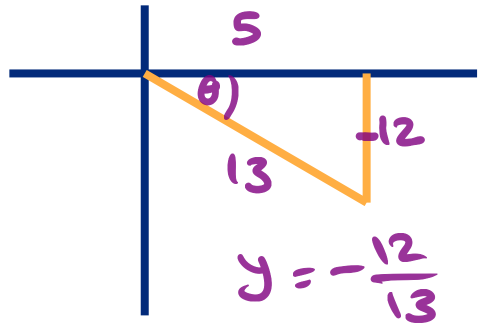


$$= \frac{5}{13}$$

If the terminal side of an angle in standard position intersects the unit circle of point A which lies in the fourth quadrant where the X-coordinate of A equals $\frac{5}{13}$ $\cos\theta$, then A = ...

(a) $\left(\frac{5}{13}, \frac{-12}{13}\right)$ (b) $\left(\frac{5}{13}, \frac{1}{13}\right)$ (c) $\left(\frac{5}{13}, \frac{12}{13}\right)$ (d) $\left(\frac{5}{13}, \frac{-8}{13}\right)$

$A = \left(\frac{5}{13}, \frac{-12}{13}\right)$



If θ is a measure of an angle in standard position and its terminal side intersects the unit circle at the point $\left(\frac{1}{2}, y\right)$ where $\boxed{y > 0}$, then $\sin\theta$ = ………

(a) $\frac{1}{2}$ (b) $\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

y

$\left(\frac{1}{2}, y\right)$ $\boxed{y > 0}$

$x^2 + y^2 = 1$

$\frac{1}{4} + y^2 = 1$

$y^2 = \frac{3}{4}$

$y = \pm\sqrt{\frac{3}{4}} = \pm\frac{\sqrt{3}}{2}$

$y = \frac{\sqrt{3}}{2}$ ✓

~~$y = -\frac{\sqrt{3}}{2}$~~

If the terminal side of a directed angle in the standard position intersect the unit circle at $(-x, x)$ where $x < 0$, then the sine of this angle = ...

~~(a) $\frac{1}{2}$~~ (b) $\frac{1}{\sqrt{2}}$ ~~(c) $\frac{\sqrt{3}}{2}$~~ (d) $\frac{-1}{\sqrt{2}}$

$$x^2 + y^2 = 1$$

$$(-x)^2 + (x)^2 = 1$$

$$x^2 + x^2 = 1$$

$$2x^2 = 1 \Rightarrow x^2 = \frac{1}{2}$$

$$x = \pm\sqrt{\frac{1}{2}} = \pm\frac{1}{\sqrt{2}}$$

$$\boxed{x = -\frac{1}{\sqrt{2}}}$$

x y

$\left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$

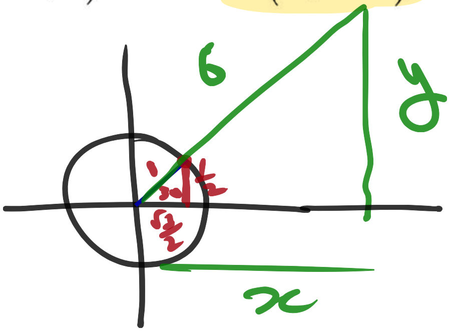
Sine

The terminal side of angle of measure 30° in its standard position intersects the circle whose centre is the origin and its radius length is 6 cm. at the point ………

(a) $(3\ ,6)$ (b) $\left(\frac{\sqrt{3}}{2}\ ,\ \frac{1}{2}\right)$ (c) $\left(3\ ,\ 3\sqrt{3}\right)$ (d) $\left(3\sqrt{3}\ ,3\right)$

$(x, y) = (\cos\theta, \sin\theta)$

$= \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$



$\frac{\sqrt{3}/2}{x} = \frac{1/2}{y} = \frac{1}{6}$

$x = 6\left(\sqrt{3}/2\right) = 3\sqrt{3}$

$y = \frac{1}{2}(6) = 3$

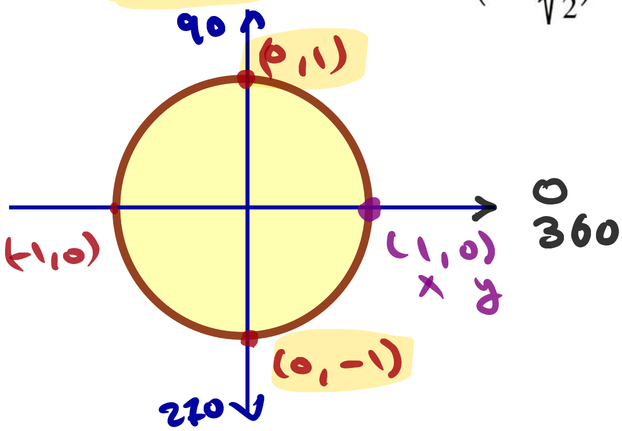
$(3\sqrt{3}, 3)$

The sine of a directed angle θ in the standard position its terminal side intersect the unit circle at the point (1 , 0) equal the cosine of a directed angle x in the standard position and its terminal side intersect the unit circle at the point ....

(a) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ (b) $(-1, 0)$ (c) $(0, -1)$ (d) $\left(x, \frac{-1}{\sqrt{2}}\right)$

$\sin \theta = \cos ?$

$\cos \theta = 0$



sine of the quadrantal angle ....

(a) equal zero.

(b) $\in]-1 , 1[$

(c) $\in \{0 , 1 , -1\}$

(d) more than or equal zero.

$0°, 90, 180, 270, 360°$

$0, 1, 0, -1, 0$

$\{0, 1, -1\}$

All the following trigonometric ratios are for the same angle θ and lies in the third quadrant except ....

S | A
t | c

(a) $\sin\theta = \frac{-3}{\sqrt{10}}$

(b) $\sec\theta = -\sqrt{10}$

(c) $\cot\theta = \frac{1}{3}$

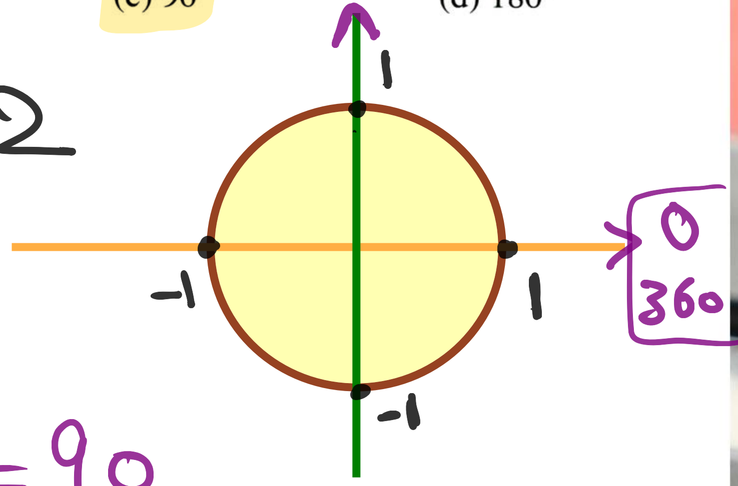
(d) $\csc\theta = 3$

If $\sin x + \cos y = 2$, x , $y \in [0°$, $360°[$, then $x + y = \cdots\cdots$ $\boxed{90}$

(a) 2 (b) 1 (c) 90° (d) 180°

$\sin x + \cos y = 2$

$1 + 1$



$90 + 0 = 90$

If $\theta = \frac{\pi}{4}(8\,n + 2)$, $n \in \mathbb{Z}$, then $\cos\theta =$ ....

(a) 1 (b) -1 (c) zero (d) $\frac{1}{\sqrt{2}}$

$\theta = \frac{\pi}{4}(0+2) = \frac{\pi}{2} = 90$

$\cos 90 = \text{Zero}$

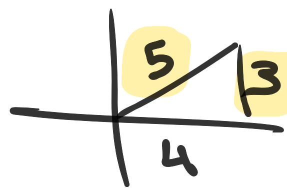
If the v.imp ~~equation~~ of a straight line : $y = \frac{3}{4}x + 1$ and it makes with the positive direction of the x-axis an angle of measure θ , then $\sin\theta = \frac{3}{5}$

(a) $\frac{3}{4}$ (b) $\frac{3}{5}$ (c) $\frac{4}{5}$ (d) $\frac{4}{3}$

$$y = mx + c$$

slope $= \tan\theta$

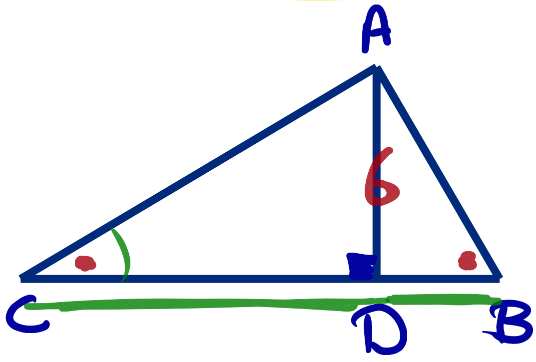
$$\tan\theta = \frac{3}{4}$$



If Δ ABC is right-angled triangle at A , $\overline{AD} \perp \overline{BC}$, AD = 6 cm. , and cot B + cot C = $\frac{5}{2}$ then BC = ·········· cm.

(a) 5 (b) 10 (c) 3.6 (d) 15

$$\cot B + \cot C = \frac{5}{2}$$



$$\frac{BD}{6} + \frac{CD}{6} = \frac{5}{2}$$

$$\frac{BD+CD}{6} = \frac{5}{2}$$

$$\frac{BC}{6} = \frac{5}{2} \Rightarrow BC = \frac{5 \times 6}{2} = 15$$

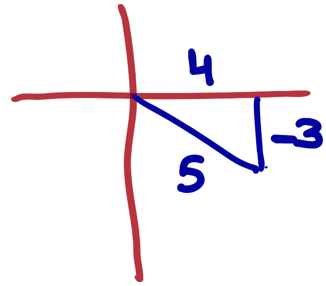
If θ is the measure of a directed angle in its standard position where its terminal side interescts the unit circle in the point B (x , y) where $x > 0$ and tan θ = $\frac{-3}{4}$, then x + y = ...

cos θ

(a) $-\frac{1}{5}$ (b) $\frac{1}{5}$ (c) zero (d) 1

$x = \cos\theta = \frac{4}{5}$

$y = \sin\theta = \frac{-3}{5}$



$x + y = \frac{4}{5} + \frac{-3}{5} = \frac{1}{5}$

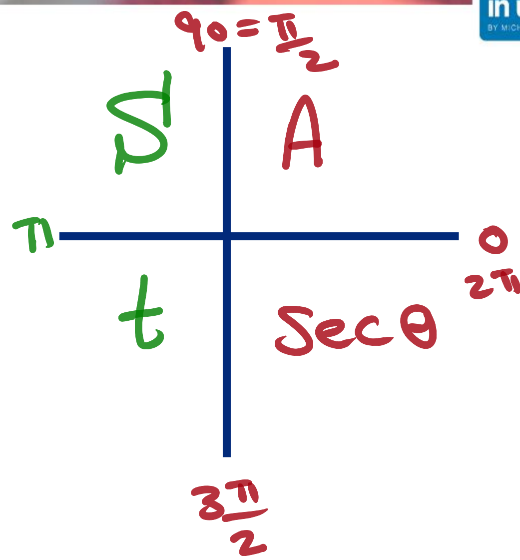
The sign of the function $f : f(X) = \sec X$ is ……….

(a) positive in $]0, \frac{\pi}{2}[$, positive in $]\frac{3\pi}{2}, 2\pi[$

(b) negative in $]0, \frac{\pi}{2}[$, negative in $]\frac{3\pi}{2}, 2\pi[$

(c) negative in $]0, \frac{\pi}{2}[$, positive in $]\frac{3\pi}{2}, 2\pi[$

(d) positive in $]0, \frac{\pi}{2}[$, negative in $]\frac{3\pi}{2}, 2\pi[$

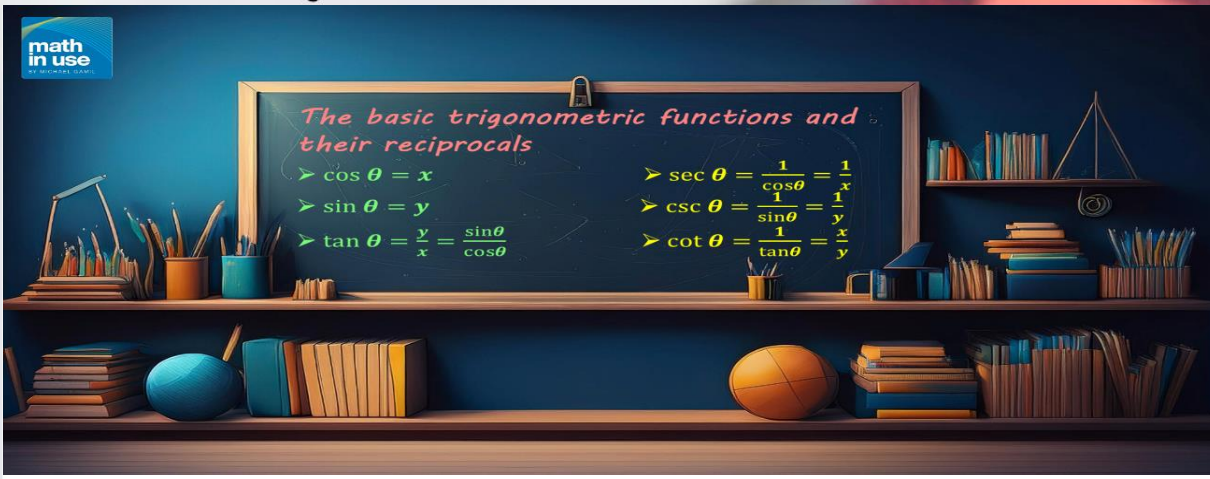


+ve $\to\ ]0, \frac{\pi}{2}[$

+ve $\to\ ]\frac{3\pi}{2}, 2\pi[$

−ve $\to\ ]\frac{\pi}{2}, \pi[$

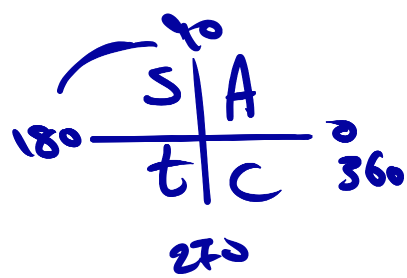
−ve $\to\ ]\pi, \frac{3\pi}{2}[$



Trigonometric functions

① **Determine the sign of the following trigonometric ratios:**

1. $\cos \underline{350°}$ 4th +ve



2. $\sec 265°$ 3rd −ve

3. $\csc\frac{3\pi}{4}$ $= \csc 135$ 2nd $= \underline{+ve}$

① Determine the sign of the following trigonometric ratios:

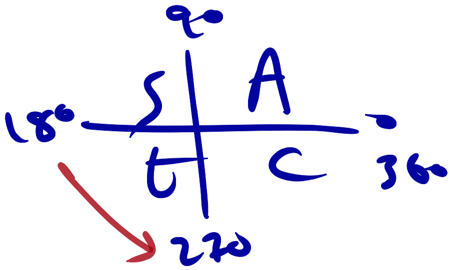
4 $\tan 410°$

$\tan 50$ $\quad +ve$

1st

5 $\cos(-165°)$

$\cos 195$ $\quad -ve$



6 $\cot\left(\frac{-3\pi}{4}\right) = \cot 225° = +ve$

② **Find all trigonometric functions of the angle whose measure is θ drawn in the standard position , its terminal side intersects the unit circle at the point :**

1 $\left(\frac{2}{3}, \frac{\sqrt{5}}{3}\right)$

$\cos\theta = x = \frac{2}{3}$

$\sec\theta = \frac{1}{x} = \frac{3}{2}$

$\sin\theta = y = \frac{\sqrt{5}}{3}$

$\csc\theta = \frac{1}{y} = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$

$\tan\theta = \frac{y}{x} = \frac{\sqrt{5}}{2}$

$\cot\theta = \frac{x}{y} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

② **Find all trigonometric functions of the angle whose measure is θ drawn in the standard position , its terminal side intersects the unit circle at the point :**

2 $\left(-\overset{x}{\frac{\sqrt{3}}{2}}, -\overset{y}{\frac{1}{2}}\right)$

$\cos\theta = x = -\frac{\sqrt{3}}{2}$

$\sin\theta = y = -\frac{1}{2}$

$\tan\theta = y/x = \frac{1}{\sqrt{3}}$

$\sec\theta = \frac{1}{x} = -\frac{2}{\sqrt{3}}$

$\csc\theta = \frac{1}{y} = -2$

$\cot\theta = \frac{x}{y} = \sqrt{3}$

③ **If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :**

1 B (0.6 , y) , $\boxed{y > 0}$

$B = (\frac{3}{5}, y)$

$x^2 + y^2 = 1$

$(\frac{3}{5})^2 + y^2 = 1$

$\frac{9}{25} + y^2 = 1$

$y^2 = 1 - \frac{9}{25} = \frac{16}{25}$

$y = \frac{4}{5}$ or $\cancel{y = -\frac{4}{5}}$

ref

$B = (\frac{3}{5}, \frac{4}{5})$

$\cos\theta = \frac{3}{5}$ $\sec\theta = \frac{5}{3}$

$\sin\theta = \frac{4}{5}$ $\csc\theta = \frac{5}{4}$

$\tan\theta = \frac{4}{3}$ $\cot\theta = \frac{3}{4}$

(3) If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :

2nd quad

[2] $B\left(-\frac{\sqrt{3}}{2}, \overset{+}{y}\right)$, where $90° < \theta < 180°$

$x^2 + y^2 = 1$

$\left(-\frac{\sqrt{3}}{2}\right)^2 + y^2 = 1$

$\frac{3}{4} + y^2 = 1$

$y^2 = 1 - \frac{3}{4}$

$y^2 = \frac{1}{4}$

$y = \pm\sqrt{\frac{1}{4}} = \pm\frac{1}{2}$

$\boxed{y = \frac{1}{2}}$ $\cancel{y = -\frac{1}{2}}$ ref.

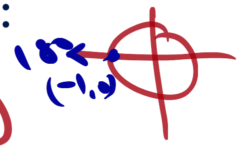
$\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\cos\theta = -\frac{\sqrt{3}}{2}$ $\sec\theta = -\frac{2}{\sqrt{3}}$

$\sin\theta = \frac{1}{2}$ $\csc\theta = 2$

$\tan\theta = -\frac{1}{\sqrt{3}}$ $\cot\theta = -\sqrt{3}$

③ If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :



3 B (–1 , y)

$x^2 + y^2 = 1$

$(-1)^2 + y^2 = 1$

$\cancel{1} + y^2 = \cancel{1}$

$y^2 = 0$

$\boxed{y = 0}$

$B = (-1, 0)$

$\cos\theta = \frac{-1}{1}$ $\quad$ $\sec\theta = -1$

$\sin\theta = \frac{0}{1}$ $\quad$ $\csc\theta = \text{undefined}$

$\tan\theta = 0$ $\quad$ $\cot\theta = \text{undefined}$

③ **If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :**

4 $B(-x, -x)$, $x > 0$

$B = \left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

$x^2 + y^2 = 1$

$(-x)^2 + (-x)^2 = 1$

$x^2 + x^2 = 1$

$2x^2 = 1$

$x^2 = \frac{1}{2}$

$x = \pm\sqrt{\frac{1}{2}} = \pm\frac{\sqrt{2}}{2}$

$\boxed{x = \frac{\sqrt{2}}{2}}$ or $\cancel{x = -\frac{\sqrt{2}}{2}}$ ~~ref~~

$\cos\theta = -\frac{\sqrt{2}}{2}$ $\sec\theta = -\sqrt{2}$

$\sin\theta = -\frac{\sqrt{2}}{2}$ $\csc\theta = -\sqrt{2}$

$\tan\theta = 1$ $\cot\theta = 1$

③ If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :

$(-,-)$ 3rd

5 B (9 a , 12 a) where $180° < \theta < 270°$

$x^2 + y^2 = 1$

$(9a)^2 + (12a)^2 = 1$

$81a^2 + 144a^2 = 1$

$225a^2 = 1$

$a^2 = \frac{1}{225}$

$a = \pm\sqrt{\frac{1}{225}}$

$a = \frac{1}{15}$ ref.

$a = -\frac{1}{15}$

$B = \left(9\left(-\frac{1}{15}\right), 12\left(-\frac{1}{15}\right)\right)$

$B = \left(\frac{-3}{5}, -\frac{4}{5}\right)$

$\cos\theta = \frac{-3}{5}$ $\quad \sec\theta = -\frac{5}{3}$

$\sin\theta = -\frac{4}{5}$ $\quad \csc\theta = -\frac{5}{4}$

$\tan\theta = \frac{4}{3}$ $\quad \cot\theta = \frac{3}{4}$

3 If θ is the measure of a directed angle in the standard position and B is the intersection point of its terminal side with the unit circle , then find all trigonometric functions of the angle θ in each of the following cases :

6 $B\left(\frac{3}{2}a , -2a\right)$, where $\frac{3\pi}{2} < \theta < 2\pi$

$+ \quad -$

4th

$270 < \theta < 360$

$x^2 + y^2 = 1$

$\frac{9}{4}a^2 + 4a^2 = 1$

$\frac{25}{4}a^2 = 1$

$a^2 = \frac{4}{25}$

$a = \pm\sqrt{\frac{4}{25}} = \pm\frac{2}{5}$

$a = \frac{2}{5}$ or $a = -\frac{2}{5}$

ref.

$B = \left(\frac{3}{\cancel{2}}\left(\frac{\cancel{2}}{5}\right), -2\left(\frac{2}{5}\right)\right)$

$= \left(\frac{3}{5}, -\frac{4}{5}\right)$

$\cos\theta = \frac{3}{5}$ $\quad \sec\theta = \frac{5}{3}$

$\sin\theta = -\frac{4}{5}$ $\quad \csc\theta = -\frac{5}{4}$

$\tan\theta = \frac{-4}{3}$ $\quad \cot\theta = -\frac{3}{4}$

④ **Find the value of x if:**

1 $x\sin^2\frac{\pi}{4}\cos\pi = \tan^2\frac{\pi}{3}\sin\frac{3\pi}{2}$

$x\left(\frac{1}{2}\right)(-1) = (3)(-1)$

$\cancel{-}\frac{1}{2}x = \cancel{-}3$

$\boxed{x = 6}$

④ **Find the value of x if:**

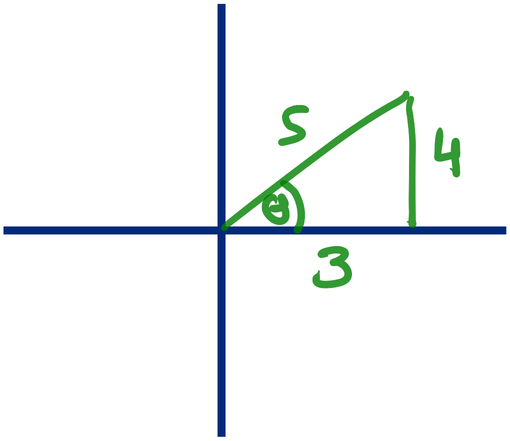
2 $\sin x = \sin 60° \cos 30° + \cos 60° \sin 30°$

Where $x \in [0°, 90°]$

$\sin x = 1$

$x = \sin^{-1}(1) = 90° = \frac{\pi}{2}$

⑤ **Find all trigonometric ratios for the angle whose measure is θ in each of the following case :**



$\boxed{1}$ $\theta \in \left]0 , \frac{\pi}{2}\right[$, $\cos\theta = 0.6$

$\cos\theta = \frac{3}{5}$ $\sec\theta = \frac{5}{3}$

$\sin\theta = \frac{4}{5}$ $\csc\theta = \frac{5}{4}$

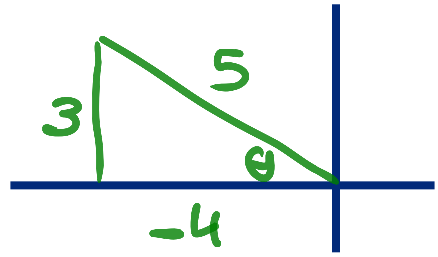
$\tan\theta = \frac{4}{3}$ $\cot\theta = \frac{3}{4}$

⑤ Find all trigonometric ratios for the angle whose measure is θ in each of the following case :

90 180

$\boxed{2}$ $\theta \in \left]\frac{\pi}{2}, \pi\right[$, $\tan\theta = -\frac{3}{4}$

2nd



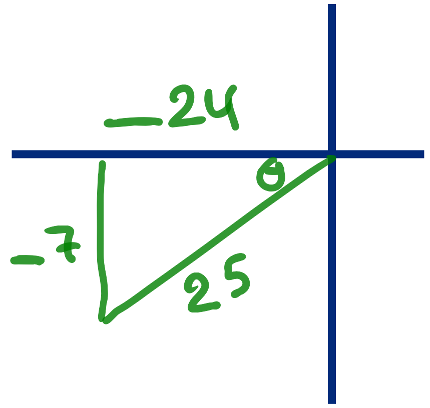
$\cos\theta = -\frac{4}{5}$ $\sec\theta = -\frac{5}{4}$

$\sin\theta = \frac{3}{5}$ $\csc\theta = \frac{5}{3}$

$\tan\theta = -\frac{3}{4}$ $\cot\theta = -\frac{4}{3}$

(5) **Find all trigonometric ratios for the angle whose measure is θ in each of the following case :**

3. $\theta \in \left]\overset{180}{\pi}, \overset{270}{\frac{3\pi}{2}}\right[$, $\csc\theta = -\frac{25}{7}$



$\sin\theta = -\frac{7}{25}$ $\quad$ $\csc\theta = -\frac{25}{7}$

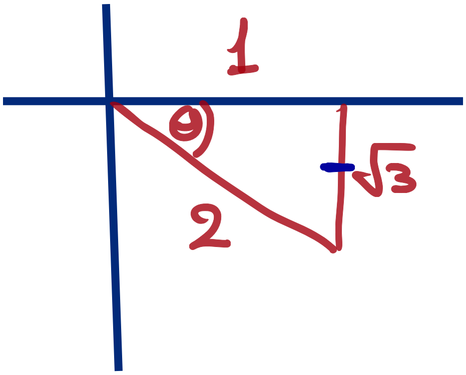
$\cos\theta = -\frac{24}{25}$ $\quad$ $\sec\theta = -\frac{25}{24}$

$\tan\theta = \frac{7}{24}$ $\quad$ $\cot\theta = \frac{24}{7}$

⑤ **Find all trigonometric ratios for the angle whose measure is θ in each of the following case :**

4 $\theta \in \left]\frac{3\pi}{2}, 2\pi\right[$, $\sec\theta = \frac{2}{1}$

270 360



$\cos\theta = \frac{1}{2}$ $\sec\theta = 2$

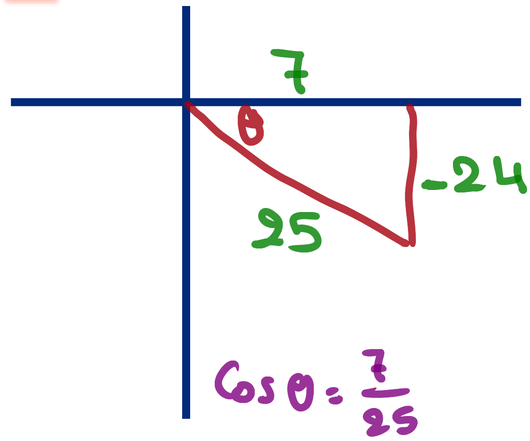
$\sin\theta = -\frac{\sqrt{3}}{2}$ $\csc\theta = -\frac{2}{\sqrt{3}} = \frac{-2\sqrt{3}}{3}$

$\tan\theta = -\sqrt{3}$ $\cot\theta = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

⑥ If $\theta \in \left]\overset{270}{\frac{3\pi}{2}}, \overset{360}{2\pi}\right[$, $\sin\theta = -\frac{24}{25}$, then Find :

$\boxed{1}$ $\frac{\cot\theta - \csc\theta}{\tan\theta - \sec\theta}$

$\boxed{2}$ $\cos\theta - \csc\theta\tan\theta$



$\boxed{1}$ $\frac{\cot\theta - \csc\theta}{\tan\theta - \sec\theta}$

$$\frac{-\frac{7}{24} - \left(-\frac{25}{24}\right)}{-\frac{24}{7} - \frac{25}{7}} = -\frac{3}{28}$$

$\cos\theta = \frac{7}{25}$

$\sin\theta = -\frac{24}{25}$

$\tan\theta = -\frac{24}{7}$

$\boxed{2}$ $\cos\theta - \csc\theta\tan\theta$

$$\frac{7}{25} - \left(-\frac{25}{\cancel{24}}\right)\left(-\frac{\cancel{24}}{7}\right)$$

$$\frac{7}{25} - \frac{25}{7} = \frac{-576}{175}$$