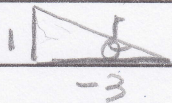


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1

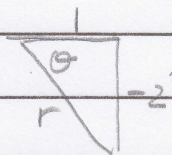
$$r = \sqrt{(1)^2 + (-3)^2} = \sqrt{10}$$



$$\sin \theta = \frac{1}{\sqrt{10}} = \frac{\sqrt{10}}{10}$$

$$\cos \theta = \frac{-3}{\sqrt{10}} = \frac{-3\sqrt{10}}{10}$$

②

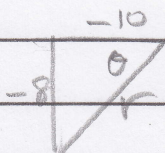


$$r = \sqrt{1^2 + (-2)^2} = \sqrt{5}$$

$$\sin \theta = \frac{-2}{\sqrt{5}} = \frac{-2\sqrt{5}}{5}$$

$$\cos \theta = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

3



$$r = \sqrt{(-10)^2 + (-8)^2} = \sqrt{164} = 2\sqrt{41}$$

$$\sin \theta = \frac{-8}{2\sqrt{41}} = \frac{-4\sqrt{41}}{41}$$

$$\cos \theta = \frac{-10}{2\sqrt{41}} = \frac{-5\sqrt{41}}{41}$$

4

165° is in Q II $\begin{array}{c|c} S & A \\ \hline T & C \end{array}$ $\sin 165^\circ$ is pos.

265° is in Q III $\rightarrow \sin 265^\circ$ is neg

210° is in Q III $\rightarrow \cos 210^\circ$ is neg

310° is in Q IV $\rightarrow \cos 310^\circ$ is pos.

$\frac{5\pi}{6}$ is in Q II $\rightarrow \sin \frac{5\pi}{6}$ is pos

$\frac{5\pi}{6}$ is in Q II $\rightarrow \cos \frac{5\pi}{6}$ is neg

$\frac{4\pi}{3}$ is in Q III $\rightarrow \sin \frac{4\pi}{3}$ is neg

$\frac{5\pi}{3}$ is in Q IV $\rightarrow \cos \frac{5\pi}{3}$ is pos

2 is in Q II $\rightarrow \sin 2$ is pos

2 is in Q II $\rightarrow \cos 2$ is neg

4 is in Q II $\rightarrow \sin 4$ is neg

4 is in Q III $\rightarrow \cos 4$ is neg

 $\frac{\pi}{2}$
1.57

3.14 0

4.71

 $\frac{3\pi}{2}$

1. $\sin 180^\circ = 0$ $(-1, 0)$ $\sin(-\pi) = 0$ $(-1, 0)$
 $\cos 180^\circ = -1$ $\cos \pi = -1$
 $\sin 270^\circ = -1$ $(0, -1)$ $\sin \frac{3\pi}{2} = -1$ $(0, -1)$
 $\cos 270^\circ = 0$ $\cos \frac{\pi}{2} = 0$

5. $\frac{s}{T} \mid \frac{A}{C}$ $\sin \theta$ is \oplus in $Q I \neq Q II$ $\rightarrow Q II$
 $\cos \theta$ is \ominus in $Q II \neq Q III$

7. $\sin \theta = 1 \rightarrow (0, 1)$ $\frac{\pi}{2}$
 $\theta = \frac{\pi}{2} + 2n\pi$
 (b) $\cos \theta = -1 \rightarrow (-1, 0)$ π
 $\theta = \pi + 2n\pi$

(c) $\sin \theta = 0$ $(-1, 0)$ and $(1, 0)$ π
 $= 0 + n\pi$

d $\sin \theta = 2 \rightarrow$ no sol (max value = 1)

9a $\sin(4\pi) = \sin(4\pi - 2\pi - 2\pi) = \sin 0 = 0$ $(1, 0)$

b $\cos \frac{7\pi}{6} \rightarrow Q III$ $\frac{s}{T} \mid \frac{A}{C} \rightarrow \tan + \rightarrow \cos \ominus$

c $\sin(-\frac{\pi}{4}) \rightarrow Q IV \rightarrow \cos + \rightarrow \sin \ominus$

d $\cos \frac{3\pi}{4} \rightarrow Q II \rightarrow \sin + \rightarrow \cos \ominus$

11 $\sin 60^\circ \rightarrow Q I \rightarrow$ all \oplus
 $\cos(-120^\circ) = \cos(-120^\circ + 360^\circ) = \cos 240^\circ \rightarrow Q III \rightarrow$ neg
 $\cos 300^\circ \rightarrow Q IV$ $\cos \oplus$
 $\sin(-210^\circ) = \sin(-210^\circ + 360^\circ) = \sin 150^\circ \rightarrow Q II$ $\sin \oplus$

sb. $\sin \theta$ is \ominus in $Q III \neq Q IV$ $\rightarrow Q III$
 $\cos \theta$ is \ominus in $Q II \neq Q III$

S/A
T/C

13 $\sin \frac{7\pi}{4} \rightarrow \text{Q IV} \rightarrow \cos + \rightarrow \sin \ominus$
 $\sin(-\frac{\pi}{6}) \rightarrow \text{Q IV} \rightarrow \cos + \rightarrow \sin \ominus$
 $\cos(\frac{3\pi}{2}) \rightarrow \frac{1}{0} \frac{(0, -1)}{0 \quad 1} = 0$

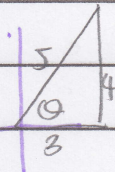
$\cos \frac{\pi}{3} \rightarrow \text{Q I} \rightarrow \text{all } \oplus$

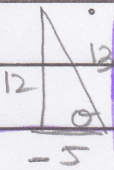
15 $\cos 89^\circ \rightarrow \text{Q I} \rightarrow \text{all } \oplus$

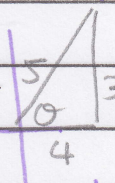
$\cos 91^\circ \rightarrow \text{Q II} \rightarrow \sin + \rightarrow \cos \ominus$

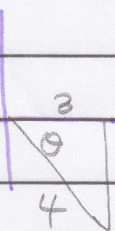
$\sin 720^\circ = \sin(720^\circ - 360^\circ - 360^\circ) = \sin 0^\circ \rightarrow \frac{0}{1} \frac{(1, 0)}{1 \quad 0} = 0$

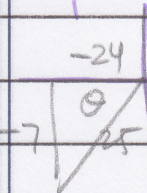
$\sin -270^\circ = \sin(-270^\circ + 360^\circ) = \sin 90^\circ \rightarrow \frac{1}{0} \frac{(0, 1)}{0 \quad 1} = 1$
 (pos)

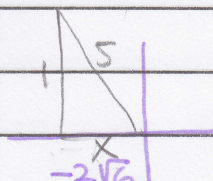
17  $\sin \theta = \frac{4}{5}$; $\cos \theta = \frac{3}{5}$

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

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

(27)  $3^2 + y^2 = 4^2$
 $y^2 = 7$
 $y = -\sqrt{7}$

23  $\sin \theta = \frac{-7}{25}$ $\sin \theta = \frac{-\sqrt{7}}{4}$

25  $x^2 + 1^2 = 5^2 \rightarrow x^2 = 24 \rightarrow x = 2\sqrt{6}$
 Q II $\rightarrow x$ is neg
 $\cos \theta = \frac{-2\sqrt{6}}{5}$

p264 CE

$$1. \quad s = \frac{45^\circ}{360^\circ} \cdot 2\pi \cdot (4) = \pi$$

$$K = \frac{45^\circ}{360^\circ} \cdot \pi \cdot 4^2 = 2\pi$$

$$\textcircled{2} \quad s = r \cdot \theta = 6 \left(\frac{2\pi}{3} \right) = 4\pi$$

$$K = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 6^2 \cdot \frac{2\pi}{3} = 12\pi$$

$$3. \quad s = r\theta = 2(4) = 8$$

$$K = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 2^2 \cdot 4 = 8$$

$$4. \quad \begin{array}{c} \text{0.05} \\ \text{2km} \end{array} \quad s = r\theta = 2(0.05) = .1\text{km} = 100\text{m}$$

b because in a large circle, a small arc is nearly a straight line

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$$4. \quad \frac{720^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{7\pi}{6}$$

$$\textcircled{b} \quad \frac{-135^\circ}{1} \cdot \frac{\pi}{180^\circ} = -\frac{3\pi}{4}$$

$$6. \quad \frac{-5\pi}{6} \cdot \frac{180^\circ}{\pi} = -150^\circ$$

$$\textcircled{b} \quad \frac{-2\pi}{1} \cdot \frac{180^\circ}{\pi} = -360^\circ$$

$$18a \quad 1000^\circ - 360^\circ - 360^\circ = 280^\circ$$

$$280^\circ - 360^\circ = -80^\circ$$

$$18c \quad \frac{4\pi}{3} + \frac{2\pi}{1} \cdot \frac{3}{3} = \frac{10\pi}{3}$$

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