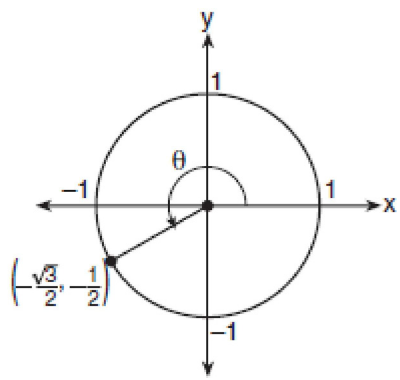
A2.A.64: Using Inverse Trigonometric Functions 2: Use inverse functions to find the measure of an angle, given its sine, cosine, or tangent

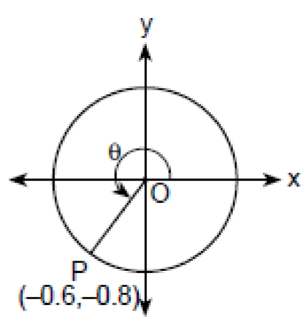
1 In the accompanying diagram of a unit circle, the ordered pair $\left(-\frac{\sqrt{3}}{2},-\frac{1}{2}\right)$ represents the point where the terminal side of θ intersects the unit circle.



What is m$\angle\theta$?

1) 210	3) 233
2) 225	4) 240

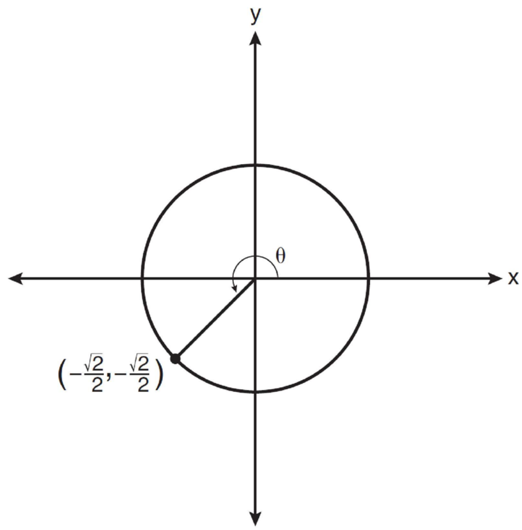
2 In the accompanying diagram, point $P(-0.6,-0.8)$ is on unit circle O.



What is the measure of angle θ to the *nearest degree*?

1) 143	3) 225
2) 217	4) 233

3 In the diagram below of a unit circle, the ordered pair $\left(-\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2}\right)$ represents the point where the terminal side of θ intersects the unit circle.



What is m$\angle\theta$?

1) 45	3) 225
2) 135	4) 240

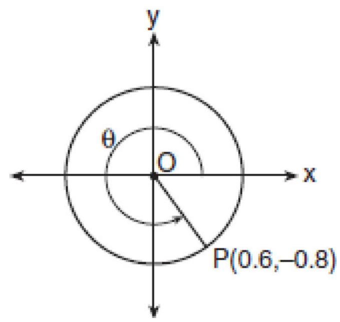
4 If θ is an angle in standard position and its terminal side passes through the point $\left(\frac{1}{2},\frac{\sqrt{3}}{2}\right)$ on a unit circle, a possible value of θ is

1) 30°	3) 120°
2) 60°	4) 150°

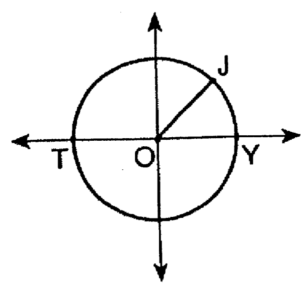
5 If θ is an angle in standard position and its terminal side passes through point $\left(-\frac{1}{2},\frac{\sqrt{3}}{2}\right)$ on the unit circle, then a possible value of θ is

1) 60º	3) 150º
2) 120º	4) 330º

6 In the accompanying diagram, point $P(0.6,-0.8)$ is on unit circle O. What is the value of θ, to the *nearest degree*?



7 In the accompanying diagram of circle O, point O is the origin, $YO = 1$, $JO = 1$, and $\overline{TOY}$ is a diameter. If the coordinates of point J are $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$, how many degrees are in $m\angle JOY$?



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Answer Section

1 ANS: 1

$$\cos\theta = -\frac{\sqrt{3}}{2}$$
$$\theta = \cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) = \pm 150°$$

. Since the terminal side of θ lies in Quadrant III, $\theta = -150°$. Coterminal angles differ by multiples of 360°. $-150+360=210$. or

$$\sin\theta = -\frac{1}{2}$$
$$\theta = \sin^{-1}\left(-\frac{1}{2}\right) = -30°$$

.

$\sin(-30) = -\sin 30 = \sin(180+30) = \sin 210$.

REF: 080510b

2 ANS: 4 REF: 060028siii

3 ANS: 3 REF: 011104a2

4 ANS: 2

$$\cos\theta = \frac{1}{2} \qquad \sin\theta = \frac{\sqrt{3}}{2}$$
$$\theta = \cos^{-1}\frac{1}{2} \text{ or } \theta = \sin^{-1}\frac{\sqrt{3}}{2}$$
$$\theta = 60° \qquad \theta = 60°$$

REF: 010205b

5 ANS: 2 REF: 069932siii

6 ANS:

307.
$$\cos\theta = 0.6$$
$$\theta = \cos^{-1} 0.6$$
$$\theta \cong 53°$$

. Since the terminal side of θ lies in Quadrant IV,

$$\cos\theta = \cos(360° - \theta)$$
$$= \cos(360 - 53)$$
$$= \cos 307$$
$$\theta = 307°$$

. or

$$\sin\theta = -0.8$$
$$\theta = \sin^{-1}(-0.8)$$
$$\theta \cong -53°$$

. Coterminal angles differ by multiples of 360°. $-53+360=307$.

REF: 010422b

7 ANS:
45

REF: 089502siii