

1. The figure above shows a circle of radius 3 along with the equilateral triangle PQO . Which of the following gives the coordinates of point Q ?

- (A) $\left(3 \cos \frac{7\pi}{6}, 3 \sin \frac{7\pi}{6}\right)$
 (B) $\left(3 \cos \frac{4\pi}{3}, 3 \sin \frac{4\pi}{3}\right)$
 (C) $\left(3 \cos \frac{5\pi}{3}, 3 \sin \frac{5\pi}{3}\right)$
 (D) $\left(3 \cos \frac{11\pi}{6}, 3 \sin \frac{11\pi}{6}\right)$

$$\theta = \frac{\pi}{3} \quad \pi + \frac{\pi}{3} = \frac{4\pi}{3}$$

It will take 1 rotation of θ to get to Q from the x -axis.

$$Q \left(3 \cos \frac{4\pi}{3}, 3 \sin \frac{4\pi}{3} \right)$$

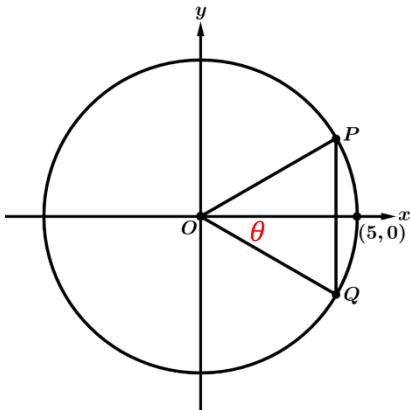
2. The figure above shows a circle of radius 9 along with the isosceles right triangle PQO . Which of the following gives the coordinates of point Q ?

- (A) $\left(9 \cos \frac{3\pi}{4}, 9 \sin \frac{3\pi}{4}\right)$
 (B) $\left(9 \cos \frac{5\pi}{6}, 9 \sin \frac{5\pi}{6}\right)$
 (C) $\left(9 \cos \frac{7\pi}{6}, 9 \sin \frac{7\pi}{6}\right)$
 (D) $\left(9 \cos \frac{5\pi}{4}, 9 \sin \frac{5\pi}{4}\right)$

$$\theta = \frac{1}{2} \cdot \frac{\pi}{2} = \frac{\pi}{4} \quad \pi + \frac{\pi}{4} = \frac{5\pi}{4}$$

It will take 1 rotation of θ to get to Q from the x -axis.

$$Q \left(9 \cos \frac{5\pi}{4}, 9 \sin \frac{5\pi}{4} \right)$$



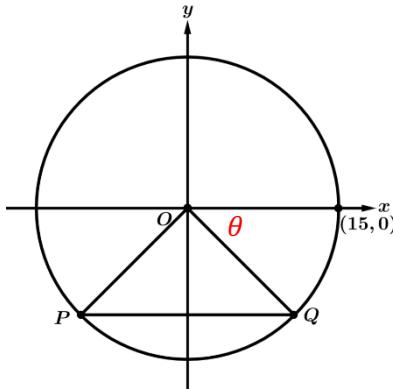
3. The figure above shows a circle of radius 5 along with the equilateral triangle PQO . Which of the following gives the coordinates of point Q ?

- (A) $\left(5 \cos \frac{\pi}{6}, 5 \sin \frac{\pi}{6}\right)$
- (B) $\left(5 \cos \frac{7\pi}{6}, 5 \sin \frac{7\pi}{6}\right)$
- (C) $\left(5 \cos \frac{11\pi}{6}, 5 \sin \frac{11\pi}{6}\right)$
- (D) $\left(5 \cos \frac{5\pi}{3}, 5 \sin \frac{5\pi}{3}\right)$

$$\theta = \frac{1}{2} \cdot \frac{\pi}{3} = \frac{\pi}{6} \quad 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

It will take 1 rotation of θ to get from Q from to the x -axis.

$$Q \left(5 \cos \frac{11\pi}{6}, 5 \sin \frac{11\pi}{6} \right)$$



4. The figure above shows a circle of radius 15 along with the isosceles right triangle PQO . Which of the following gives the coordinates of point Q ?

- (A) $\left(15 \cos \frac{\pi}{4}, 15 \sin \frac{\pi}{4}\right)$
- (B) $\left(-15 \cos \frac{\pi}{4}, 15 \sin \frac{\pi}{4}\right)$
- (C) $\left(15 \cos \frac{\pi}{4}, -15 \sin \frac{\pi}{4}\right)$
- (D) $\left(-15 \cos \frac{\pi}{4}, -15 \sin \frac{\pi}{4}\right)$

$$\theta = \frac{1}{2} \cdot \frac{\pi}{2} = \frac{\pi}{4}$$

It will take 1 rotation of $-\theta$ to get to Q from the x -axis.

$$Q \left(15 \cos \left(-\frac{\pi}{4} \right), 15 \sin \left(-\frac{\pi}{4} \right) \right) = \left(15 \cos \left(\frac{\pi}{4} \right), -15 \sin \left(\frac{\pi}{4} \right) \right)$$

cosine is even so $\cos \left(-\frac{\pi}{4} \right) = \cos \left(\frac{\pi}{4} \right)$

sine is odd so $\sin \left(-\frac{\pi}{4} \right) = -\sin \left(\frac{\pi}{4} \right)$

Directions: Find the exact values of the following expressions.

$$5. \sin \frac{3\pi}{2} = -1$$

$$6. \cos 2\pi = 1$$

$$7. \cos \frac{\pi}{2} = 0$$

$$8. \sin \pi = 0$$

$$9. \cos 0 = 1$$

$$10. \sin \frac{\pi}{2} = 1$$

$$11. \sin \frac{-\pi}{2} = -1$$

$$12. \cos 3\pi = -1$$

Directions: Find the exact values of the following expressions.

$$13. \sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$$

$$14. \cos \frac{\pi}{3} = \frac{1}{2}$$

$$15. \cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$$

$$16. \sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$$

$$17. \sin \frac{\pi}{6} = \frac{1}{2}$$

$$18. \cos \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$19. \cos 2\pi = 1$$

$$20. \sin 2\pi = 0$$

$$21. \cos \frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$$

$$22. \cos \frac{11\pi}{6} = \frac{\sqrt{3}}{2}$$

$$23. \sin \frac{7\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$24. \sin \frac{7\pi}{6} = -\frac{1}{2}$$