

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

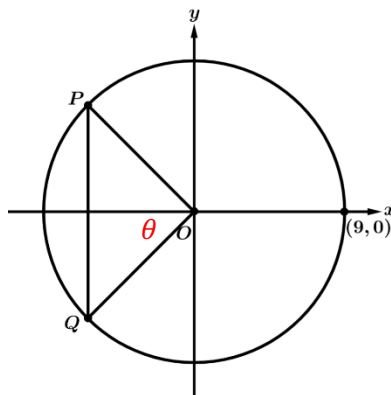
(C) $\left(3 \cos \frac{5\pi}{3}, 3 \sin \frac{5\pi}{3}\right)$

(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) $\left(9 \cos \frac{5\pi}{6}, 9 \sin \frac{5\pi}{6}\right)$

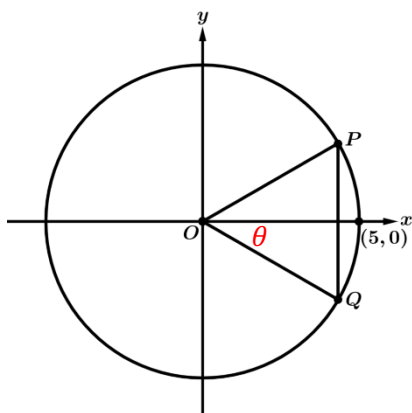
(C) $\left(9 \cos \frac{7\pi}{6}, 9 \sin \frac{7\pi}{6}\right)$

(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) $\left(5 \cos \frac{7\pi}{6}, 5 \sin \frac{7\pi}{6}\right)$

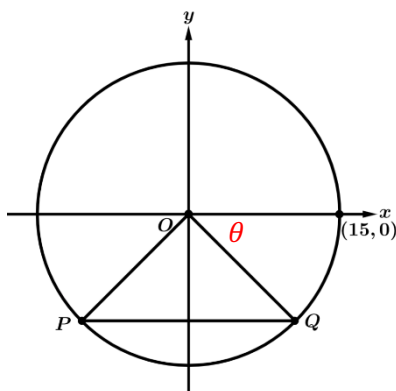
(C) $\left(5 \cos \frac{11\pi}{6}, 5 \sin \frac{11\pi}{6}\right)$

(D) $\left(5 \cos \frac{5\pi}{3}, 5 \sin \frac{5\pi}{3}\right)$

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

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.

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

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

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

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