

Classroom Voting Questions: Precalculus

Polar Coordinates

1. A point has polar coordinates $(r, \theta) = \left(3, \frac{5\pi}{6}\right)$. Find the point's rectangular coordinates.

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

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

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

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

2. Give Cartesian coordinates for the point with polar coordinates $(2, \pi)$.

(a) $(0, 2)$

(b) $(-2, 0)$

(c) $(2, 0)$

(d) $(0, -2)$

3. A point has rectangular coordinates $(x, y) = (-1, -\sqrt{3})$. Which one of the following are polar coordinates for the point?

(a) $\left(2, \frac{7\pi}{6}\right)$

(b) $\left(-2, \frac{7\pi}{6}\right)$

(c) $\left(-2, \frac{\pi}{3}\right)$

(d) $\left(-2, \frac{4\pi}{3}\right)$

4. Give Cartesian coordinates for the point with polar coordinates $(3, \frac{\pi}{6})$.
- (a) $(\sqrt{3}, 1)$
 - (b) $(\frac{3}{2}, \frac{3\sqrt{3}}{2})$
 - (c) $(\frac{3\sqrt{3}}{2}, \frac{3}{2})$
 - (d) $(\frac{\sqrt{3}}{2}, \frac{1}{2})$
5. Give polar coordinates (r, θ) for the point with Cartesian coordinates $(6, 8)$.
- (a) $(.93, 10)$
 - (b) $(10, .93)$
 - (c) $(10, 4.13)$
 - (d) $(100, .93)$
6. Give polar coordinates (r, θ) for the point with Cartesian coordinates $(-6, -8)$.
- (a) $(10, 5.36)$
 - (b) $(10, .93)$
 - (c) $(10, 4.07)$
 - (d) $(10, 2.21)$
7. Give polar coordinates (r, θ) for the point with Cartesian coordinates $(0, -2)$.
- (a) $(4, \pi)$
 - (b) $(4, \frac{3\pi}{2})$
 - (c) $(2, \pi)$
 - (d) $(2, \frac{3\pi}{2})$
8. True or False: A point in the xy -plane has a unique representation in polar coordinates.
- (a) True, and I am very confident.
 - (b) True, but I am not very confident.
 - (c) False, but I am not very confident.
 - (d) False, and I am very confident.

9. Which of the following polar coordinates represent the point with Cartesian coordinates $(-1, 0)$?

- (a) $(-1, 0)$
- (b) $(1, \pi)$
- (c) $(1, -\pi)$
- (d) $(-1, 2\pi)$
- (e) more than one of the above
- (f) all of the above

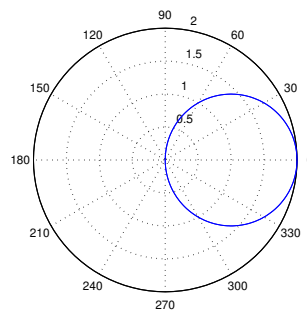
10. The equation $r = 2$ represents what type of graph in the Cartesian plane?

- (a) horizontal line
- (b) vertical line
- (c) a line through the origin
- (d) circle

11. The equation $\theta = \frac{\pi}{3}$ represents what type of graph in the Cartesian plane?

- (a) horizontal line
- (b) vertical line
- (c) a line through the origin
- (d) circle

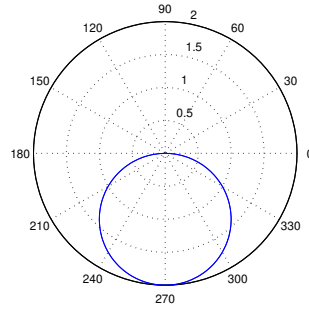
12. The following graph is which function expressed using polar coordinates?



- (a) $r = 2 \sin \theta$
- (b) $r = 1$

- (c) $r = \cos \theta$
- (d) $r = 2 \cos \theta$

13. The following graph is which function expressed using polar coordinates?



- (a) $r = -2 \sin \theta$
- (b) $r = \cos \theta$
- (c) $r = -\cos \theta$
- (d) $r = 2 \cos \theta$

14. Which of the following is a plot of the polar equation $r = 1 + 2 \cos \theta$?

