



Precalculus

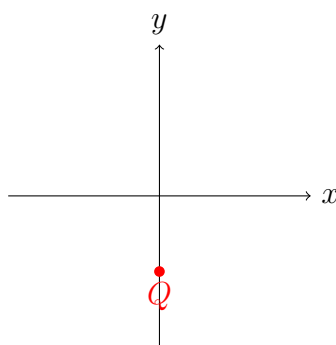
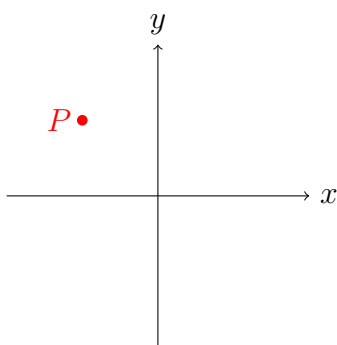
Topic: Polar Coordinates

Instructions

Solve the following problems related to polar coordinates. Show all work clearly and check your solutions.

Practice Problems

1. A point is graphed in rectangular form. Find polar coordinates for the point, with $r > 0$ and $0 < \theta < 2\pi$.



2. Find the rectangular coordinates for the point whose polar coordinates are given.

(i) $(4, \frac{\pi}{6})$

(iii) $(\sqrt{2}, -\frac{\pi}{4})$

(ii) $(6, \frac{2\pi}{3})$

(iv) $(5, \frac{5\pi}{3})$

3. Convert the equation to polar form.

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|-----------------------|-------------------------------|
| (i) $(-1, 1)$ | (iii) $(\sqrt{8}, \sqrt{8})$ |
| (ii) $(\sqrt{3}, -3)$ | (iv) $(-\sqrt{6}, -\sqrt{2})$ |

4. Convert to Polar Form

- | | |
|----------------------|-----------------|
| (i) $x = y$ | (iii) $y = x^2$ |
| (ii) $x^2 + y^2 = 9$ | (iv) $y = 5$ |

5. Convert the Polar Equation to Rectangular Coordinates.

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|--------------------------------|------------------------------------------------|
| (i) $r = 7$ | (vi) $r = 2 \csc \theta$ |
| (ii) $r = -3$ | (vii) $r = 1 + \cos \theta$ |
| (iii) $\theta = \frac{\pi}{2}$ | (viii) $r = 3(1 - \sin \theta)$ |
| (iv) $\theta = \pi$ | (ix) $r = \frac{1}{\sin \theta - \cos \theta}$ |
| (v) $r \cos \theta = 6$ | |

Multiple Choice Questions

- (1) What is the polar coordinate form for the point $P(1, 1)$?
- A. $(r = 1, \theta = \frac{\pi}{4})$
 B. $(r = 1, \theta = \frac{\pi}{6})$
 C. $(r = 2, \theta = \frac{\pi}{3})$
 D. $(r = 2, \theta = \frac{\pi}{2})$
- (2) Which equation represents a circle in polar coordinates?
- A. $x^2 + y^2 = r^2$
 B. $r = 1$
 C. $r^2 = 9$
 D. $x^2 + y^2 = 1$
- (3) What is the solution for the polar equation $r = 4 \sin \theta$?
- A. $x^2 + y^2 = 4y$
 B. $x^2 + y^2 = 4x$
 C. $x^2 + y^2 = 4$
 D. $x^2 + y^2 = 2y$