

Name Key

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Change the polar coordinates (r, θ) to rectangular coordinates (x, y) .

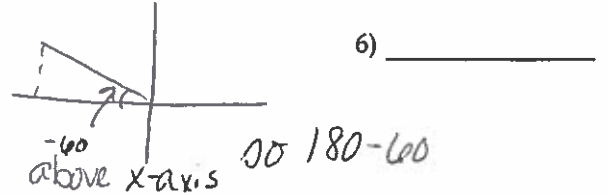
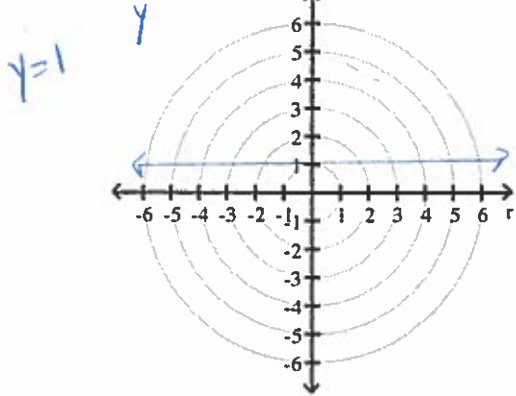
- 1) $(4, 45^\circ)$ $x = r \cos \theta = 4 \cos 45^\circ = 4(\frac{\sqrt{2}}{2})$ $y = r \sin \theta = 4 \sin 45^\circ = 4(\frac{\sqrt{2}}{2})$ 1) $(2\sqrt{2}, 2\sqrt{2})$
- 2) $(-6, \pi)$ $x = -6 \cos \pi$ $y = -6 \sin \pi$ 2) $(6, 0)$
- 3) $(9, -\frac{\pi}{3})$ $x = 9 \cos(-\frac{\pi}{3}) = 9(\frac{1}{2})$ $y = 9 \sin(-\frac{\pi}{3}) = 9(-\frac{\sqrt{3}}{2})$ 3) $(\frac{9}{2}, -\frac{9\sqrt{3}}{2})$

For the point given in rectangular coordinates, find equivalent polar coordinates (r, θ) for $r > 0$ and $0^\circ \leq \theta < 360^\circ$.

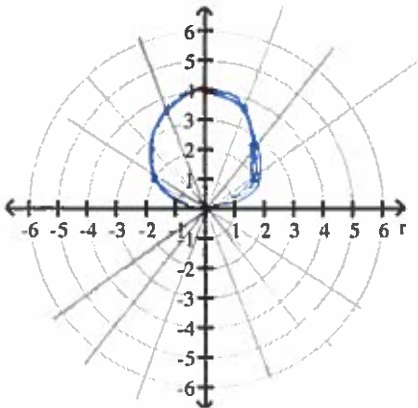
- 4) $(3\sqrt{3}, 3)$ $r = \sqrt{(3\sqrt{3})^2 + 3^2} = \sqrt{27+9} = \sqrt{36} = r=6$ $\theta = \tan^{-1}(\frac{3}{3\sqrt{3}})$ 4) $(6, 30^\circ)$
- 5) $(-6, 6\sqrt{3})$ $r = \sqrt{(6\sqrt{3})^2 + (-6)^2} = \sqrt{36 \cdot 3 + 36} = \sqrt{144} = r=12$ $\theta = \tan^{-1}(\frac{6\sqrt{3}}{-6})$ $\theta = -60$ 5) $(12, 120^\circ)$

Graph the polar equation.

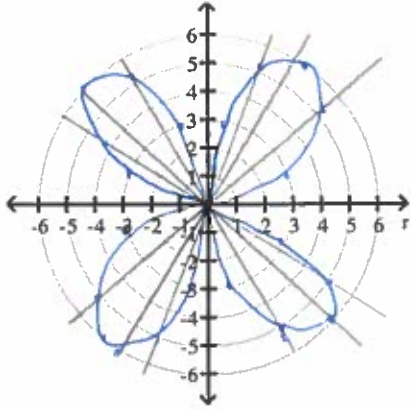
6) $r \sin \theta = 1$ $r = \frac{1}{\sin \theta}$



7) $r = 4 \sin \theta$



8) $r = 6 \sin 2\theta$



8) _____

Write the equation in polar form.

9) $x^2 + y^2 = -3x$ \Rightarrow $\frac{r^2}{r} = \frac{-3rcos\theta}{r}$ $r = -3cos\theta$

9) $r = -3cos\theta$

10) $x = -9$
 $r cos\theta = -9$ $r = -9/cos\theta$

10) $r = -9sec\theta$

Write the polar equation in terms of x and y.

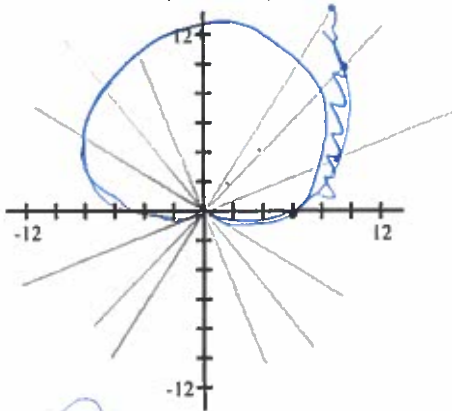
11) $r = \frac{5}{5cos\theta + 6sin\theta}$ $5 = r(5cos\theta + 6sin\theta) = 5 = \frac{5rcos\theta}{x} + \frac{6rsin\theta}{y}$

11) $5 = 5x + 6y$

Graph the curve.

12) $r = 6 + 6 \sin \theta$ (cardioid)

12) _____



Draw in 30, 45, 60° lines use table