

Name _____ Date _____ Period _____

Worksheet 8.1—Polar Intro & Derivatives

Show all work. No calculator except unless specifically stated.

Short Answer

Convert the following equations to polar form.

1. $y = 4$

2. $3x - 5y + 2 = 0$

3. $x^2 + y^2 = 25$

Convert the following equations to rectangular form.

4. $r = 3\sec\theta$

5. $r = 2\sin\theta$

6. $\theta = \frac{5\pi}{6}$

For the following, find $\frac{dy}{dx}$ for the given value of θ .

7. $r = 2 + 3\sin\theta$, $\theta = \frac{3\pi}{2}$

8. $r = 3(1 - \cos\theta)$, $\theta = \frac{\pi}{2}$

9. $r = 4\sin\theta$, $\theta = \frac{\pi}{3}$

10. $r = 2\sin(3\theta)$, $\theta = \frac{\pi}{4}$

11. Find the point of horizontal and vertical tangency for $r = 1 + \sin\theta$. Give your answers in polar form (r, θ) .

Make a table (of values, not one at which to eat) and sketch the graph.

12. $r = 2 - 2\sin\theta$

13. $r = 1 + 2\cos\theta$

14. $r = 4\cos(2\theta)$

15. $r^2 = 4\sin(2\theta)$

Multiple Choice

16. If $a \neq 0$ and $\theta \neq 0$, all of the following must represent the same point in polar coordinates *except* which ordered pair?

- (A) (a, θ) (B) $(-a, -\theta)$ (C) $(-a, \theta - \pi)$ (D) $(-a, \theta + \pi)$ (E) $(a, \theta - 2\pi)$

17. Which of the following gives the slope of the polar curve $r = f(\theta)$ graphed in the xy -plane?

- (A) $\frac{dr}{d\theta}$ (B) $\frac{dy}{d\theta}$ (C) $\frac{dx}{d\theta}$ (D) $\frac{dy/d\theta}{dx/d\theta}$ (E) $\frac{dy}{dx} \cdot \frac{dr}{d\theta}$

18. Which of the following represents the graph of the polar curve $r = 2\sec\theta$?

