

Assignment 9-2

Without using a calculator, accurately plot each of the following polar coordinate points on a separate graph. Give the rectangular coordinates of the point.

1. $\left(5, \frac{\pi}{2}\right)$

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

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

4. $\left(-1, \frac{7\pi}{6}\right)$

Without using a calculator, plot each of the following rectangular points and give two sets of polar coordinates for $0 \leq \theta < 2\pi$.

5. $(5, -5)$

6. $(-1, \sqrt{3})$

7. $(-5, 0)$

8. $(-5, -5\sqrt{3})$

9. Use a calculator to give rectangular coordinates for the polar point $(-7.2, 4.5)$.

10. Use a calculator to give two sets of polar coordinates ($0 \leq \theta < 2\pi$) for the rectangular point $(-2, 5)$.

Match each of the following equations with one of the descriptions given without using a calculator.

11. $r = 3\sin(2\theta)$

12. $r = 4\cos\theta$

13. $r\cos\theta = 4$

14. $r = 4 + 2\cos\theta$

- a. a circle with y -axis symmetry
- b. a four petal rose
- c. a vertical line
- d. a limaçon with y -axis symmetry
- e. a circle with x -axis symmetry
- f. a horizontal line.
- g. a limaçon with x -axis symmetry

Convert the following rectangular equations to polar (solve for r) and sketch the graph.

15. $y = 5$

16. $2x + y + 5 = 0$

17. $y^2 = 2x$

Convert the following polar equations to rectangular and sketch the graph.

18. $r = 5$

19. $\theta = \frac{3\pi}{4}$

20. $r = 3\sec\theta$

Use a calculator to graph. Determine if the interval $0 \leq \theta < 2\pi$ produces a complete graph.

21. $r = 5\sin\left(\frac{3\theta}{2}\right)$

22. $r = 5 - 6\cos\theta$

23. $r = \theta$

24. Without using a calculator graph $r = 2 + 4\sin\theta$. Find an equation of the line tangent to the curve at the point $(2, 0)$.

25. Without using a calculator graph $r = 4\cos\theta$. Find an equation of the line tangent to the curve at the polar point $\left(2\sqrt{3}, \frac{\pi}{6}\right)$.

26. Without using a calculator graph $r = 1 - \sin\theta$. Find the points at which the curve has horizontal tangent lines.

Without using a calculator graph each equation and find equations of each tangent at the pole.

27. $r = 5\sin\theta$

28. $r = 3 - 3\cos\theta$

29. $r = 4\cos(3\theta)$