

Warm up

1. Convert from rectangular to polar and give 3 equivalent points.

$$(1, -1)$$

2. Convert from a polar equation to a rectangular equation.

a. $r = 5$

c. $\theta = -\frac{\pi}{3}$


b. $r = 4 \cos \theta$

3. Convert from a rectangular equation to a polar equation.

$$x = 3$$

Apr 23-9:28 AM

GO COUGARS!



Homework Questions

In Exercises 13–20, plot the point given in polar coordinates and find the corresponding rectangular coordinates for the point.

13. $(4, -\frac{\pi}{3})$	14. $(2, \frac{7\pi}{6})$
15. $(-1, -\frac{3\pi}{4})$	16. $(-3, \frac{2\pi}{3})$
17. $(0, -\frac{7\pi}{6})$	18. $(0, \frac{5\pi}{4})$

In Exercises 21–28, use a graphing utility to find the rectangular coordinates of the point given in polar coordinates. Round your results to two decimal places.

21. $(2, \frac{2\pi}{9})$	22. $(4, \frac{11\pi}{9})$
23. $(-4.5, 1.3)$	24. $(8.25, 3.5)$
25. $(2.5, 1.58)$	26. $(5.4, 2.85)$
27. $(-4.1, -0.5)$	28. $(8.2, -3.2)$

In Exercises 29–36, plot the point given in rectangular coordinates and find two sets of polar coordinates for the point for $0 \leq \theta < 2\pi$.

29. $(-7, 0)$	30. $(0, -5)$
31. $(1, 1)$	32. $(-3, -3)$
33. $(-\sqrt{3}, -\sqrt{3})$	34. $(\sqrt{3}, -1)$
35. $(6, 9)$	36. $(5, 12)$

In Exercises 37–42, use a graphing utility to find one set of polar coordinates for the point given in rectangular coordinates. (There are many correct answers.)

37. $(3, -2)$	38. $(-5, 2)$
39. $(\sqrt{3}, 2)$	40. $(3\sqrt{2}, 3\sqrt{2})$
41. $(\frac{3}{2}, \frac{3}{2})$	42. $(\frac{2}{3}, \frac{2}{3})$

In Exercises 43–60, convert the rectangular equation to polar form. Assume $a > 0$.

43. $x^2 + y^2 = 9$	44. $x^2 + y^2 = 16$
45. $y = 4$	46. $y = x$
47. $x = 8$	48. $x = a$
49. $3x - 6y + 2 = 0$	50. $4x + 7y - 2 = 0$
51. $xy = 4$	52. $2xy = 1$
53. $(x^2 + y^2)^2 = 9(x^2 - y^2)$	54. $y^2 - 8x - 16 = 0$
55. $x^2 + y^2 - 6x = 0$	56. $x^2 + y^2 - 8y = 0$

In Exercises 61–80, convert the polar equation to rectangular form.

61. $r = 6 \sin \theta$	62. $r = 2 \cos \theta$
63. $\theta = \frac{4\pi}{3}$	64. $\theta = \frac{5\pi}{3}$
65. $\theta = \frac{5\pi}{6}$	66. $\theta = \frac{11\pi}{6}$
67. $\theta = \frac{\pi}{2}$	68. $\theta = \pi$

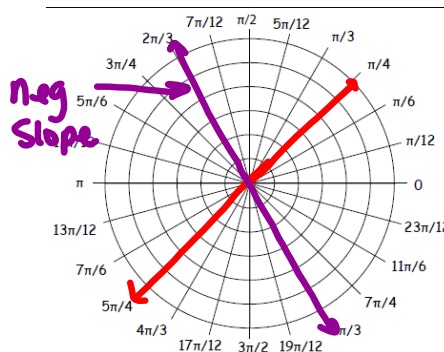
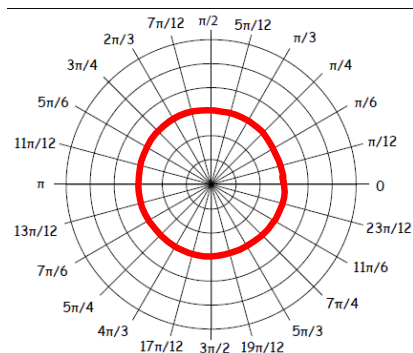
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9.7 Graphs of Polar Equations

Apr 19-10:08 AM

$r = 3$
 $r^2 = 9$
 $x^2 + y^2 = 9$

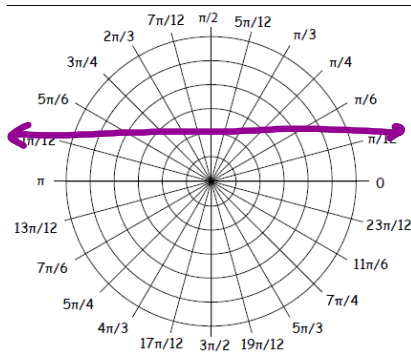
$\theta = \frac{\pi}{4}$ $\theta = \frac{2\pi}{3}$
 $\frac{\sin\theta}{\cos\theta} = 1$
 $\frac{y}{x} = 1$ $y = x$



Apr 19-10:05 AM

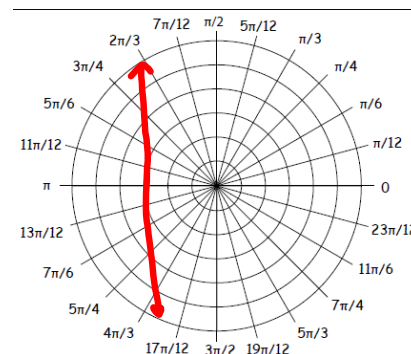
$$r \sin \theta = 2$$

$$y = 2$$



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

$$x = -3$$



Apr 19-10:09 AM

$$r = 4 \sin \theta$$

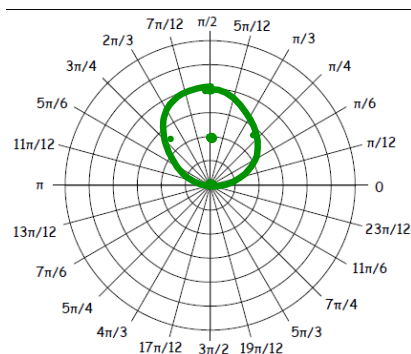
$$r^2 = 4r \sin \theta$$

$$x^2 + y^2 = 4y$$

$$x^2 + y^2 - 4y + 2^2 = 4$$

$$x^2 + (y - 2)^2 = 4$$

$$m(0, 2) \quad r = 2$$



$$r = -2 \cos \theta$$

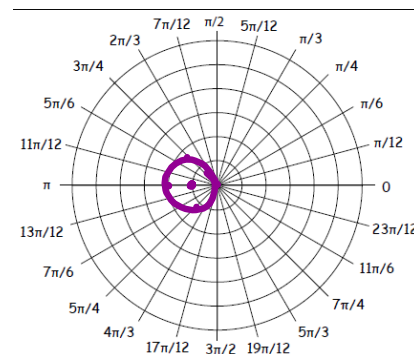
$$r^2 = -2r \cos \theta$$

$$x^2 + y^2 = -2x$$

$$(x^2 + 2x + 1) + y^2 = 1$$

$$(x + 1)^2 + y^2 = 1$$

$$m(-1, 0) \quad r = 1$$



Apr 19-10:11 AM

HOMework



p720 #23-26

Packet page 2 part 1 # 1-6, 10, 12
sketch and convert to rect algebraically

Feb 2-9:51 PM