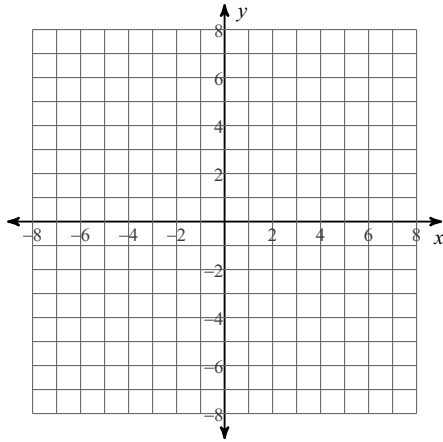


Test 10.6-10.9

Sketch the curve for each pair of parametric equations.

1) $x = -\frac{t^2}{2}, y = t$



Write each pair of parametric equations in rectangular form.

2) $x = 4\sec \frac{t}{2}, y = 2\tan \frac{t}{2}$

3) $x = 3\sin 2t, y = 2\cos 2t$

Use the parameter to write each rectangular equation as a pair of parametric equations.

4) $x = -\frac{y^2}{3}, t = \frac{y}{3} + \frac{1}{3}$

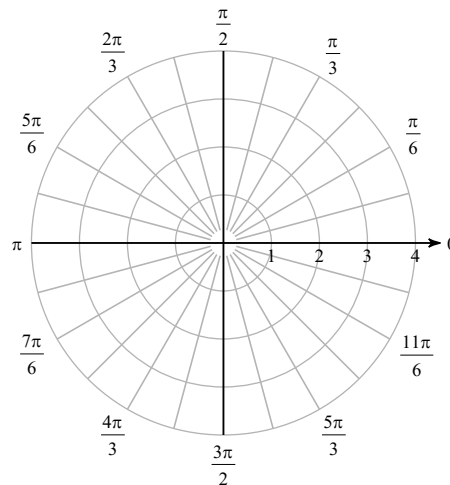
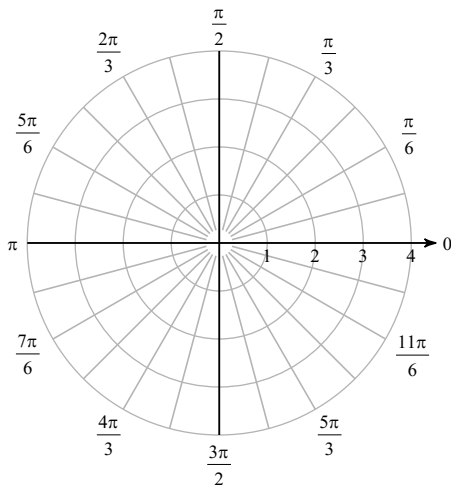
5) $x = \frac{y^2}{6}, t = y + 1$

6) A golf ball is struck across a flat fairway at an angle of 60° with an initial speed of 132 ft/s. Write a set of parametric equations for the motion of the golf ball.

Plot the point with the given polar coordinates.

7) $\left(4, \frac{7\pi}{4}\right)$

8) $\left(-4, -\frac{\pi}{6}\right)$



Find all pairs of polar coordinates that describe the same point as the provided polar coordinates.

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

Convert each pair of polar coordinates to rectangular coordinates.

10) $\left(-4, -\frac{5\pi}{4}\right)$

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

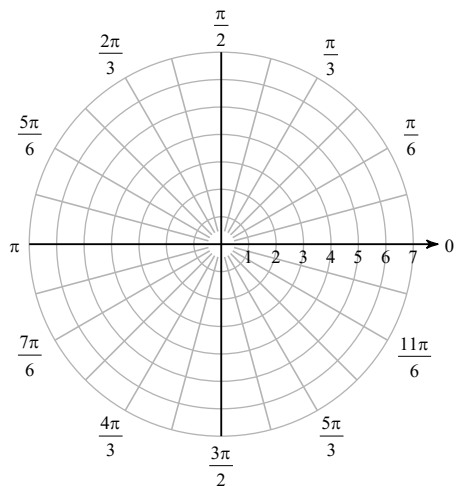
Convert each pair of rectangular coordinates to polar coordinates where $r > 0$ and $0 \leq \theta < 2\pi$.

12) $(-2\sqrt{2}, -2\sqrt{2})$

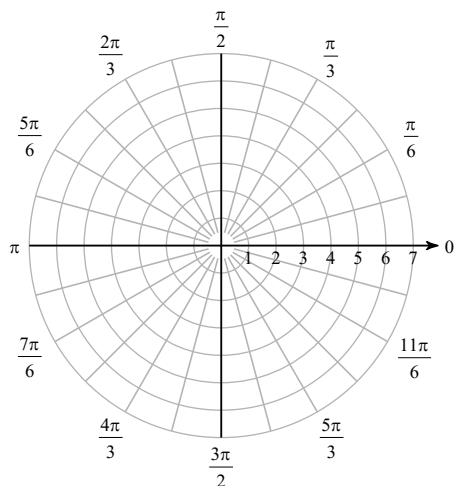
13) $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

Consider each polar equation. Classify the curve; and sketch the graph.

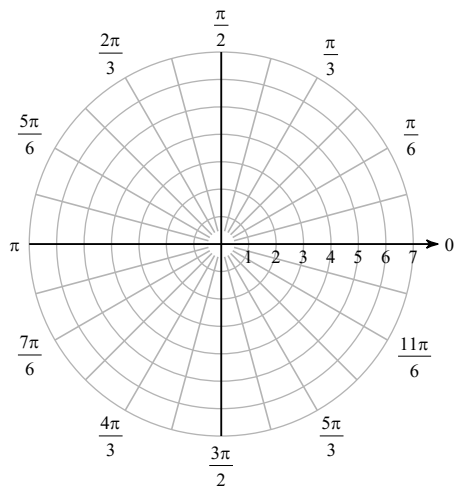
14) $r = 7\sin \theta$



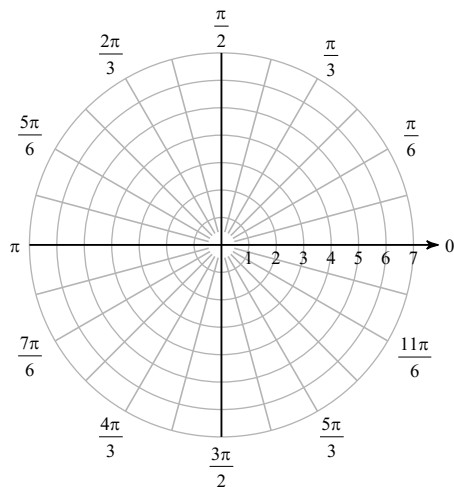
15) $r = 1 + 2\sin \theta$



16) $r^2 = 25\sin(2\theta)$



17) $r = 2\cos(2\theta)$



Convert each equation from rectangular to polar form.

18) $x = \frac{y^2}{5}$

19) $y = x$

Convert each equation from polar to rectangular form.

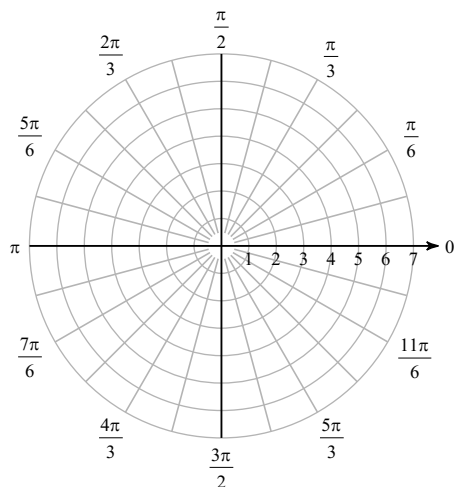
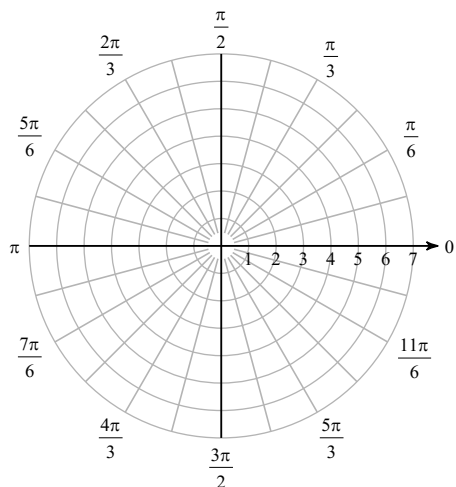
20) $r = -2\cos\theta + 6\sin\theta$

21) $r = 2\cot\theta\csc\theta$

Each polar equation describes a conic section with a focus at the origin. Find the eccentricity, classify the conic section, and graph the polar equation.

22) $r = \frac{6.9}{1 - 2.3\cos\theta}$

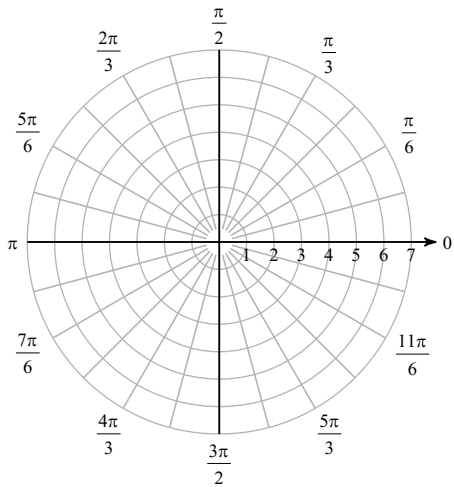
23) $r = \frac{4}{2 + 2\sin\theta}$



Each problem describes a conic section with a focus at the origin. Classify the conic section, and graph the polar equation.

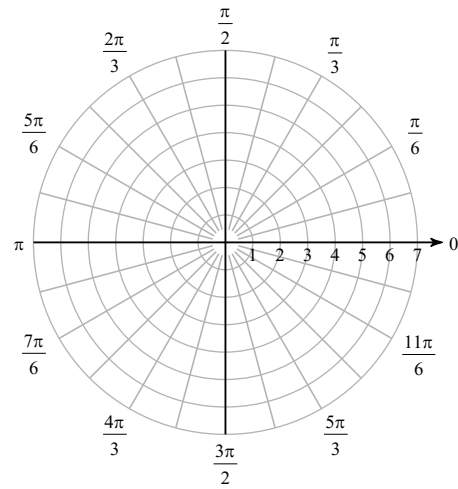
24) Eccentricity: 0.4

Vertices: $\left(-\frac{12}{7}, 0\right), (4, 0)$



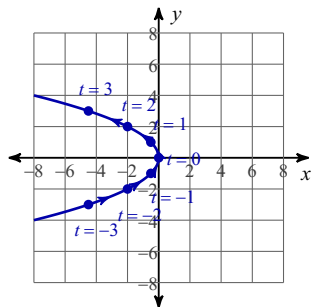
25) Eccentricity: 1

Directrix for focus at origin: $y = -3$



Answers to Test 10.6-10.9 (ID: 1)

1)



$$2) \frac{x^2}{16} - \frac{y^2}{4} = 1$$

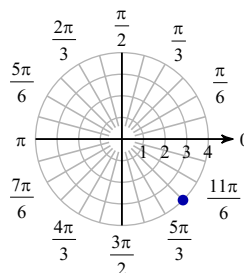
$$3) \frac{x^2}{9} + \frac{y^2}{4} = 1$$

$$4) x = -3t^2 + 2t - \frac{1}{3}, y = 3t - 1$$

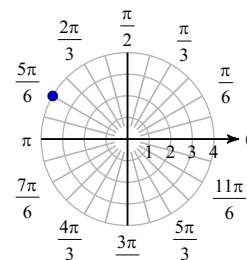
$$5) x = \frac{t^2}{6} - \frac{t}{3} + \frac{1}{6}, y = t - 1$$

$$6) x = 66t, y = 66t\sqrt{3} - \frac{32.17t^2}{2}$$

7)



8)



$$9) \left(4, -\frac{3\pi}{4} + 2n\pi\right) \text{ and } \left(-4, -\frac{3\pi}{4} + (2n+1)\pi\right)$$

where n is an integer

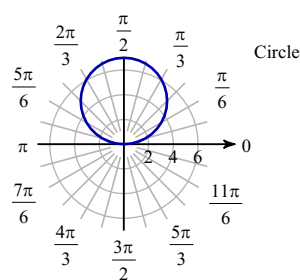
$$10) (2\sqrt{2}, -2\sqrt{2})$$

$$11) \left(-\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$$

$$12) \left(4, \frac{5\pi}{4}\right)$$

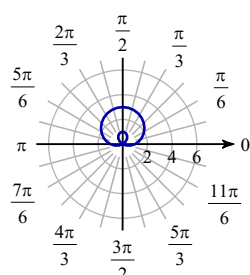
$$13) \left(1, \frac{7\pi}{4}\right)$$

14)



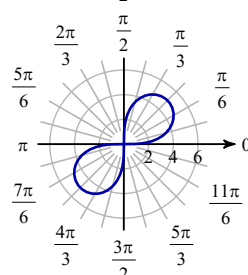
Circle

15)



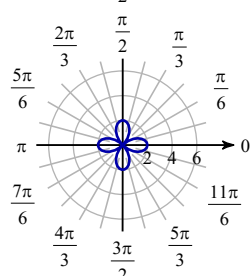
Looped limaçon

16)



Lemniscate

17)



Rose

$$18) r = 5 \cot \theta \csc \theta$$

$$19) \cot \theta = 1$$

$$20) (x+1)^2 + (y-3)^2 = 10$$

$$21) x = \frac{y^2}{2}$$

