

In Problems 1-20, graph the curve whose parametric equations are given using a graphing calculator. Graph the curve by hand and show its orientation.

1.  $x = 3t + 2$ ,  $y = t + 1$ ;  $0 \leq t \leq 4$
2.  $x = t - 3$ ,  $y = 2t + 4$ ;  $0 \leq t \leq 2$
3.  $x = t + 2$ ,  $y = \sqrt{t}$ ;  $t \geq 0$
4.  $x = \sqrt{2t}$ ,  $y = 4t$ ;  $t \geq 0$
5.  $x = t^2 + 4$ ,  $y = t^2 - 4$ ;  $-\infty < t < \infty$
6.  $x = \sqrt{t + 4}$ ,  $y = \sqrt{t - 4}$ ;  $t \geq 0$
7.  $x = 3t^2$ ,  $y = t + 1$ ;  $-\infty < t < \infty$
8.  $x = 2t - 4$ ,  $y = 4t^2$ ;  $-\infty < t < \infty$
9.  $x = 2e^t$ ,  $y = 1 + e^t$ ;  $t \geq 0$
10.  $x = e^t$ ,  $y = e^{-t}$ ;  $t \geq 0$
11.  $x = \sqrt{t}$ ,  $y = t^{3/2}$ ;  $t \geq 0$
12.  $x = t^{3/2} + 1$ ,  $y = \sqrt{t}$ ;  $t \geq 0$
13.  $x = 2 \cos t$ ,  $y = 3 \sin t$ ;  $0 \leq t \leq 2\pi$
14.  $x = 2 \cos t$ ,  $y = 3 \sin t$ ;  $0 \leq t \leq \pi$
15.  $x = 2 \cos t$ ,  $y = 3 \sin t$ ;  $-\pi \leq t \leq 0$
16.  $x = 2 \cos t$ ,  $y = \sin t$ ;  $0 \leq t \leq \pi/2$
17.  $x = \sec t$ ,  $y = \tan t$ ;  $0 \leq t \leq \pi/4$
18.  $x = \csc t$ ,  $y = \cot t$ ;  $\pi/4 \leq t \leq \pi/2$
19.  $x = \sin^2 t$ ,  $y = \cos^2 t$ ;  $0 \leq t \leq 2\pi$
20.  $x = t^2$ ,  $y = \ln t$ ;  $t > 0$

Using a grapher, graph the plane curve given by the set of parametric equations and the restriction for the parameter. Then find the equivalent rectangular equation.

1.  $x = \frac{1}{2}t$ ,  $y = 6t - 7$ ;  $-1 \leq t \leq 6$
2.  $x = t$ ,  $y = 5 - t$ ;  $-2 \leq t \leq 3$
3.  $x = t^3$ ,  $y = t - 4$ ;  $-1 \leq t \leq 10$
4.  $x = \sqrt{t}$ ,  $y = 2t + 3$ ;  $0 \leq t \leq 8$
5.  $x = t^2$ ,  $y = \sqrt{t}$ ;  $0 \leq t \leq 4$
6.  $x = t^3 + 1$ ,  $y = t$ ;  $-3 \leq t \leq 3$
7.  $x = t + 3$ ,  $y = \frac{1}{t + 3}$ ;  $-2 \leq t \leq 2$
8.  $x = 2t^3 + 1$ ,  $y = 2t^3 - 1$ ;  $-4 \leq t \leq 4$
9.  $x = 2t - 1$ ,  $y = t^2$ ;  $-3 \leq t \leq 3$
10.  $x = \frac{1}{3}t$ ,  $y = t$ ;  $-5 \leq t \leq 5$
11.  $x = e^{-t}$ ,  $y = e^t$ ;  $-\infty < t < \infty$
12.  $x = 2 \ln t$ ,  $y = t^2$ ;  $0 < t < \infty$
13.  $x = 3 \cos t$ ,  $y = 3 \sin t$ ;  $0 \leq t \leq 2\pi$
14.  $x = 2 \cos t$ ,  $y = 4 \sin t$ ;  $0 \leq t \leq 2\pi$
15.  $x = \cos t$ ,  $y = 2 \sin t$ ;  $0 \leq t \leq 2\pi$
16.  $x = 2 \cos t$ ,  $y = 2 \sin t$ ;  $0 \leq t \leq 2\pi$
17.  $x = \sec t$ ,  $y = \cos t$ ;  $-\frac{\pi}{2} < t < \frac{\pi}{2}$
18.  $x = \sin t$ ,  $y = \csc t$ ;  $0 < t < \pi$
19.  $x = 1 + 2 \cos t$ ,  $y = 2 + 2 \sin t$ ;  $0 \leq t \leq 2\pi$
20.  $x = 2 + \sec t$ ,  $y = 1 + 3 \tan t$ ;  $0 < t < \frac{\pi}{2}$