Section 10.1

Eliminate the parameter to find a Cartesian equation of the curve. Do not sketch the curve.

1. $x = \frac{1}{2}\cos(t)$, $y = 2\sin(t)$

$2x = \cos(t)$, $\frac{y}{2} = \sin(t)$

$\cos^2 t + \sin^2 t = 1$

$(2x)^2 + \left(\frac{y}{2}\right)^2 = 1$

$$\boxed{4x^2 + \frac{y^2}{4} = 1}$$

2. $x = \tan^2(t)$, $y = \sec(t)$

$x = \sec^2(t) - 1$

$$\boxed{x = y^2 - 1}$$

3. $x = e^t - 1$, $y = e^{2t}$

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

$$\boxed{y = (x+1)^2}$$

4. $x = \sqrt{t+1}$, $y = \sqrt{t-1}$

$\left.\begin{array}{l} x^2 = t+1 \\ x^2 - 1 = t \end{array}\right\}$ $y = \sqrt{x^2 - 1 - 1}$

$$\boxed{y = \sqrt{x^2 - 2}}$$

Set up a table of values for t, x, and y, and sketch the curve in the x-y-plane. Use arrows to show the direction in which the curve is traced.

5. $x = t^2 + 1$, $y = t - 1$, $-2 \le t \le 2$

t	x	y
-2	5	-3
-1	2	-2
0	1	-1
1	2	0
2	5	1