

Solutions - 10.1

7. (a) Graphy.

(b) We have

$$t = \frac{5 - y}{2}$$

so substituting, we get

$$x = \left(\frac{5 - y}{2}\right)^2 - 2$$

10. (a) Graphy.

(b) We have

$$t = \sqrt[3]{y}$$

so substituting, we get

$$x = \sqrt[3]{y^2}$$

13. (a) Since we know that

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

then we have

$$x + y = 1$$

(b) Graphy.

15. (a) Since

$$e^t e^{-t} = 1$$

then we have

$$xy = 1$$

(b) Graphy.

19. In the x -direction, the particle will travel from -1 to 1. In the y -direction, the particle will travel from 0 to -1 back to 0. So the particle is really just traveling counter-clockwise around the bottom half of a circle.

24. (a) This matches up with III.

(b) This matches up with I.

(c) This matches up with IV.

39. We have (why?)

$$\begin{aligned}x &= b \cos \theta + (a - b) \cos \theta = a \cos \theta \\y &= b \sin \theta\end{aligned}$$

We know that

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

So

$$\frac{y^2}{b^2} + \frac{x^2}{a^2} = 1$$

which is the equation for an ellipse.