

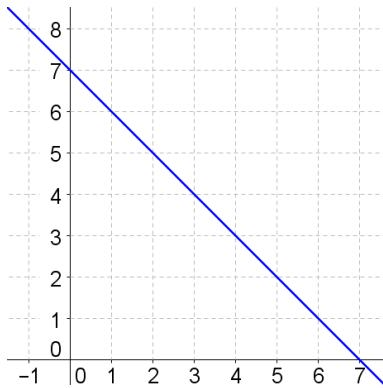
SM3H HW11.4 Eliminating the Parameter

For problems 1-6, eliminate the parameter and write an equation for the curve in the form of $y = f(x)$. Then, sketch the curve.

1) $a = \langle t + 3, 4 - t \rangle$

$$\begin{aligned} x &= t + 3 \\ t &= x - 3 \end{aligned}$$

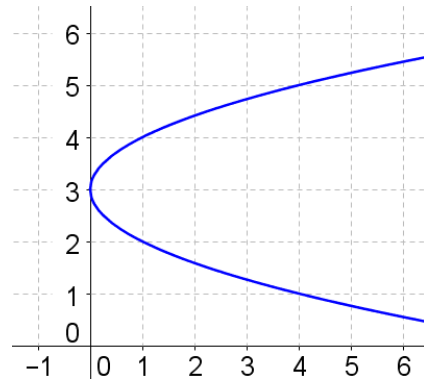
$$\begin{aligned} y &= 4 - t \\ y &= 4 - (x - 3) \\ y &= -x + 7 \end{aligned}$$



2) $b = \langle t^2, 3 - t \rangle$

$$\begin{aligned} x &= t^2 \\ t &= \pm\sqrt{x} \end{aligned}$$

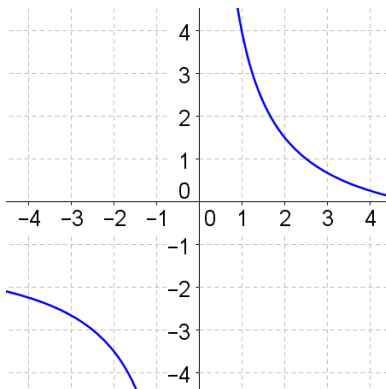
$$\begin{aligned} y &= 3 - t \\ y &= 3 - (\pm\sqrt{x}) \\ y &= \pm\sqrt{x} + 3 \end{aligned}$$



3) $c = \langle \frac{5}{t}, t - 1 \rangle$

$$\begin{aligned} x &= \frac{5}{t} \\ t &= \frac{5}{x} \end{aligned}$$

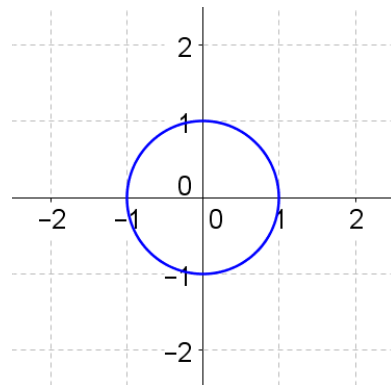
$$\begin{aligned} y &= t - 1 \\ y &= \frac{5}{x} - 1 \end{aligned}$$



4) $d = \langle \sin t, \cos t \rangle$

$$x = \sin t, y = \cos t$$

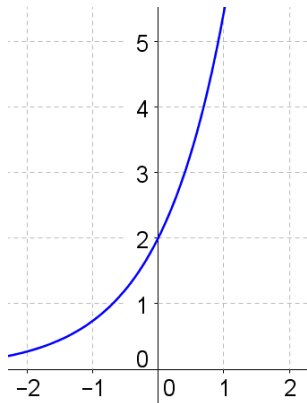
$$\begin{aligned} \cos^2 t + \sin^2 t &= 1 \\ y^2 + x^2 &= 1 \end{aligned}$$



5) $f = \langle \ln t, 2t \rangle$

$$\begin{aligned} x &= \ln t \\ t &= e^x \end{aligned}$$

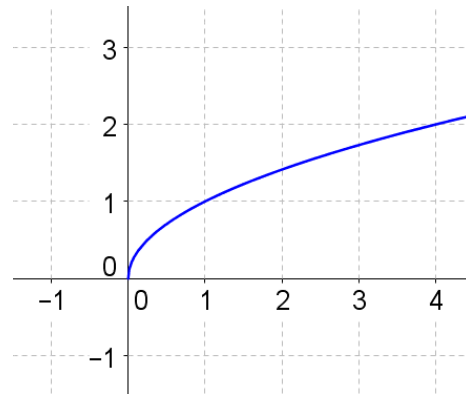
$$\begin{aligned} y &= 2t \\ y &= 2e^x \end{aligned}$$



6) $g = \langle \sqrt{t}, \sqrt[4]{t} \rangle$

$$\begin{aligned} x &= \sqrt{t} \\ t &= x^2 \end{aligned}$$

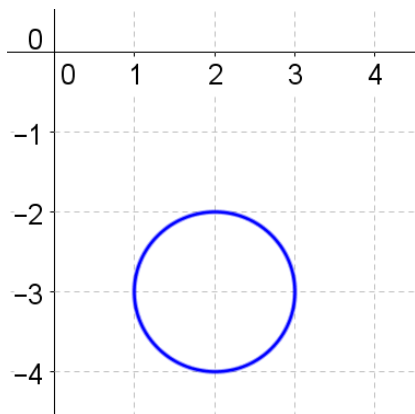
$$\begin{aligned} y &= \sqrt[4]{t} \\ y &= \sqrt[4]{x^2} \\ y &= \sqrt{x} \end{aligned}$$



7) $h = \langle \cos(t) + 2, \sin(t) - 3 \rangle$

$$\begin{aligned} x &= \cos t + 2, y = \sin t - 3 \\ \cos t &= x - 2, \sin t = y + 3 \end{aligned}$$

$$\begin{aligned} \cos^2 t + \sin^2 t &= 1 \\ (x - 2)^2 + (y + 3)^2 &= 1 \end{aligned}$$



8) $j = \langle \sin(t) - 3, \cos(t) + 3 \rangle$

$$\begin{aligned} x &= \sin t - 3, y = \cos t + 3 \\ \sin t &= x + 3, \cos t = y - 3 \end{aligned}$$

$$\begin{aligned} \cos^2 t + \sin^2 t &= 1 \\ (y - 3)^2 + (x + 3)^2 &= 1 \end{aligned}$$

