Exercise 3

For the following exercises, sketch the curves below by eliminating the parameter t. Give the orientation of the curve.

$$x = 2t + 4,\ y = t - 1$$

Solution

Since the second equation is simpler, solve it for t

$$t = y + 1$$

and plug it into the first equation.

$$\begin{aligned} x &= 2(y+1) + 4 \\ &= (2y+2) + 4 \\ &= 2y + 6 \end{aligned}$$

Solve for y.

$$y = \frac{1}{2}x - 3$$

The graph is of a line with slope $1/2$ and y-intercept $(0, -3)$. Plugging in $t = 0$ gives $x = 4$ and $y = -1$, and plugging in $t = 1$ gives $x = 6$ and $y = 0$. The orientation therefore goes from the bottom to the top.