

## Exercise 2

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

$$x = \cos(t), \quad y = \sin(t), \quad (0, 2\pi]$$

### Solution

In order to eliminate  $t$ , square both sides of each equation

$$x^2 = \cos^2 t, \quad y^2 = \sin^2 t$$

and then add the respective sides together.

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

The graph is of a circle centered at the origin with radius 1. Plugging in  $t = 0$  gives  $x = 1$  and  $y = 0$ , and plugging in  $t = \pi/2$  gives  $x = 0$  and  $y = 1$ . The orientation therefore goes counterclockwise.

