Section 11.1: Parametric equations

Warm up:

Describe the motion given by $x = 8$, $y = 7\sin(t)$ for all t.

Group work:

Problem 1 *Try to figure out the shape of the following curve and then eliminate the parameter and check your intuition.*

$$x = \ln t - 1 \qquad y = (\ln t)^2$$

Problem 2 *Find parametric equations for the path of a particle moving around the circle*

$$(x-3)^2 + (y+7)^2 = 4$$

(a) *one time around clockwise starting at* $(5, -7)$.

(b) *three times around counterclockwise starting at* $(5, -7)$.

(c) *halfway around clockwise starting at* $(1, -7)$.

Problem 3 *Find the intersection point(s) of the lines*

$$x = -6 + 9t, \qquad y = 3 - 2t \tag{1}$$

and

$$x = 3 + t, \qquad y = -4 - 2t. \tag{2}$$

Do they intersect at the same time?

Problem 4 *Consider the curve defined by the parameterization* $x = t^2$, $y = t^3 - 3t$. *Show that this curve has two tangent lines at* $(3, 0)$, *and find the equations of the tangent lines there.*
