

Group Work, Section 10.1

1. Give a parameterization for the line that moves between the points $(1, 2)$ and $(-3, -6)$.
2. Are any of the following graphs (in the (x, y) plane) actually a line? Show that your answer is true by finding either y as a function of x , or x as a function of y :

(a) $x = t^2, y = t^3, -1 \leq t \leq 1$.

(b) $x = t - 1, y = t + 4$

(c) $x = e^t - 1, y = e^t + 4$

(d) $x = 1 + 3t, y = 2 - t^2$

3. Try to plot the following set of parametric equations:

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

4. If x, y are each plotted below, find parametrizations in t for them, and plot the graph of the parametric equations.

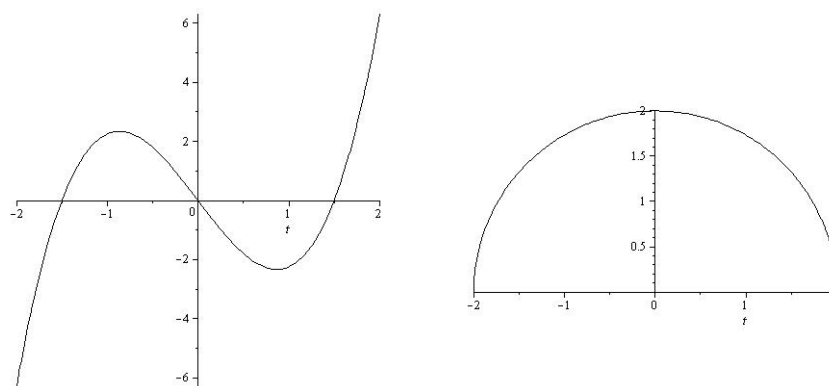


Figure 1: Graphs of x (left) and y (right), where each is in terms of t .

5. Give a parameterization of the path of a particle of the form:

$$x(t) = a_1 \cos(a_2 t) \quad y(t) = a_3 \sin(a_4 t) \quad 0 \leq t \leq 2\pi$$

so that the particle moves around a circle three times CW (with a radius of 2) starting at $(-2, 0)$.

What does the curve look like if $a_1 = 1, a_3 = 3, a_2 = a_4 = 1$?