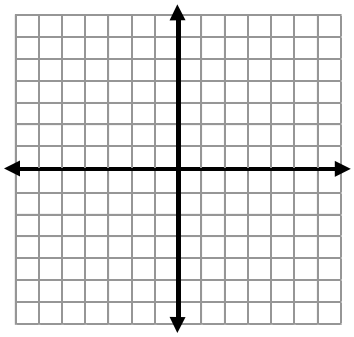
The process of sketching a curve using parametric equations can sometimes be made easier by ***eliminating the parameter***. This allows the same graph to be produced from an equivalent rectangular equation (in x and y).

For example, we can change parametric form with three variables into a two variable equation.

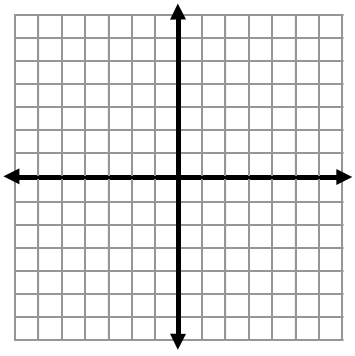
$x = t + 2$ $y = t^2$	⇨	$t = x - 2$	⇨	$y = (x - 2)^2$	⇨	$y = (x - 2)^2$
parametric form		solve for t in one equation		substitute into the second equation		rectangular form

Example 1: Sketch the curve given by the equations by first eliminating the parameter.

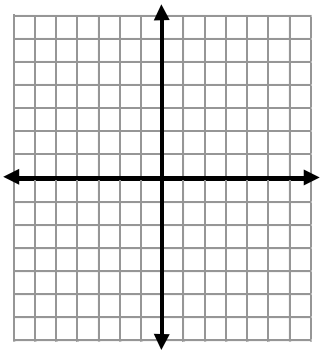
a. $x = t$ and $y = -2t$, $-2 \le t \le 2$



b. $x = 2t$ and $y = |t - 2|$



c. $x = \frac{1}{\sqrt{t}}$ and $y = 2t^2$

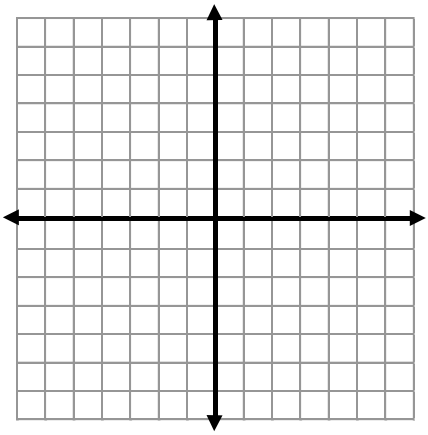


Pythagorean Trigonometric Identities

$\sin^2\theta + \cos^2\theta = 1$ $\quad 1 + \tan^2\theta = \sec^2\theta$ $\quad 1 + \cot^2\theta = \csc^2\theta$

Example 2: Sketch the curve represented by x = 2cosθ and y = 3sinθ, 0 ≤ϑ≤2π,

by eliminating the angle parameter.



Example 3: Find a set of parametric equations to represent the graph of y = 4x – 3 using the following parameters.

a. t = x

b. t = 2 – x

Homework: Page 774-775 # 5c, and #7 – 17all (part b for each), 41-47 odd