60. Folium of Descartes: $x = \dfrac{3t}{1 + t^3}$

$y = \dfrac{3t^2}{1 + t^3}$

61. *Conjecture*

(a) Use a graphing utility to graph the curves represented by the two sets of parametric equations.

$x = 4 \cos t \qquad x = 4 \cos(-t)$

$y = 3 \sin t \qquad y = 3 \sin(-t)$

(b) Describe the change in the graph when the sign of the parameter is changed.

(c) Make a conjecture about the change in the graph of parametric equations when the sign of the parameter is changed.

(d) Test your conjecture with another set of parametric equations.

62. *Writing* Review Exercises 23–26 and write a short paragraph describing how the graphs of curves represented by different sets of parametric equations can differ even though eliminating the parameter from each yields the same rectangular equation.

Writing About Concepts

63. State the definition of a plane curve given by parametric equations.

64. Explain the process of sketching a plane curve given by parametric equations. What is meant by the orientation of the curve?

Projectile Motion **A projectile is launched at a height of h feet above the ground and at an angle θ with the horizontal. If the initial velocity is v_0 feet per second, the path of the projectile is modeled by the parametric equations**

$$x = (v_0 \cos \theta)t \quad \text{and} \quad y = h + (v_0 \sin \theta)t - 16t^2.$$

In Exercises 65 and 66, use a graphing utility to graph the paths of a projectile launched from ground level at the specified values of θ and v_0. For each case, use the graph to approximate the maximum height and the range of the projectile.

65. (a) $\theta = 60°$, $v_0 = 88$ feet per second
(b) $\theta = 60°$, $v_0 = 132$ feet per second
(c) $\theta = 45°$, $v_0 = 88$ feet per second
(d) $\theta = 45°$, $v_0 = 132$ feet per second

66. (a) $\theta = 15°$, $v_0 = 60$ feet per second
(b) $\theta = 15°$, $v_0 = 100$ feet per second
(c) $\theta = 30°$, $v_0 = 60$ feet per second
(d) $\theta = 30°$, $v_0 = 100$ feet per second

In Exercises 67–76, given that

$$\frac{dy}{dx} = \frac{dy/dt}{dx/dt}, \quad \frac{dx}{dt} \neq 0$$

(a) find dy/dx using this formula.

(b) Eliminate the parameter and find dy/dx. Then compare your result with that of part (a).

67. $x = 2t$, $y = 3t - 1$

68. $x = \sqrt{t}$, $y = 3t - 1$

69. $x = t + 1$, $y = t^2 + 3t$

70. $x = t^2 + 3t + 2$, $y = 2t$

74. $x = \sqrt{t}$, $y = \sqrt{t - 1}$

In Exercises 77–80, find dy/dx.

77. $x = t^2$, $y = 5 - 4t$

78. $x = \sqrt[3]{t}$, $y = 4 - t$

In Exercises 81–90, find dy/dx and d^2y/dx^2, and find the slope and concavity (if possible) at the given value of the parameter.

	Parametric Equations	*Point*
81.	$x = 2t$, $y = 3t - 1$	$t = 3$
82.	$x = \sqrt{t}$, $y = 3t - 1$	$t = 1$
83.	$x = t + 1$, $y = t^2 + 3t$	$t = -1$
84.	$x = t^2 + 3t + 2$, $y = 2t$	$t = 0$
88.	$x = \sqrt{t}$, $y = \sqrt{t - 1}$	$t = 2$