

**Goals:** To write parametric equations in rectangular form and vice versa.

Find a rectangular equation for the plane curve defined by the parametric equations.

1)  $x = 3t, y = t + 7$

2)  $x = t - 3, y = t^2 + 5$

3)  $x = \sin \theta, y = 3 \cos \theta$

4)  $x = 5 \tan \theta, y = 4 \cot \theta$

5)  $x = \sec t, y = \tan t$

**Find parametric equations for the rectangular equation.**

6)  $y = 3x - 4$

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

8)  $y = x^4 - 1$

9)  $(x + 2)^2 = 3y$

**Solve the problem.**

- 10) Ron throws a ball straight up with an initial speed of 60 feet per second from a height of 3 feet. Find parametric equations that describe the motion of the ball as a function of time. How long is the ball in the air? When is the ball at its maximum height? What is the maximum height of the ball?

## Answers

Testname: PARAMETRICS2010.TST

- 1) Answer:  $y = x/3 + 7$
- 2) Answer:  $y = x^2 + 6x + 14$
- 3) Answer:  $9x^2 + y^2 = 9$
- 4) Answer:  $xy = 20$
- 5) Answer:  $x^2 - y^2 = 1$
- 6) Answer:  $x = t$  and  $y = 3t - 4$
- 7) Answer:  $x = 2 + 2 \cos t$  and  $y = 4 + 2 \sin t$
- 8) Answer:  $x = t$  and  $y = t^4 - 1$
- 9) Answer:  $x = t - 2$  and  $y = \frac{t^2}{3}$
- 10) Answer:  $x = 0$  and  $y = -16t^2 + 60t + 3$   
3.799 sec, 1.875 sec,  
59.25 feet