

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Using the pair of parametric equations, find the values of **A** and **B** in the table.

1) $x = 7t + 8$, $y = t + 3$, for $0 \leq t \leq 7$

t	x	y
0		
A	43	
6		B

Graph the curve whose parametric equations are given.

2) $x = 2t$, $y = t + 2$; $-2 \leq t \leq 3$

3) $x = 8 \sin t$, $y = 8 \cos t$; $0 \leq t \leq 2\pi$

4) $x = \sqrt{t}$, $y = 3t + 4$; $0 \leq t \leq 4$

5) $x = 2t - 1$, $y = t^2 + 4$, $-4 \leq t \leq 4$

6) $x = \cos 4t$, $y = \sin 5t$, $0 \leq t \leq 2\pi$

Eliminate the parameter.

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

8) $x = 3t$, $y = t + 3$; $-2 \leq t \leq 3$

9) $x = t^3 + 1$, $y = t^3 - 10$; $-2 \leq t \leq 2$

10) $x = 6 \sin t$, $y = 6 \cos t$; $0 \leq t \leq 2\pi$

11) $x = 5 \tan t$, $y = 4 \cot t$

Solve the problem.

- 12) A projectile is fired with an initial velocity of 400 feet per second at an angle of 45° with the horizontal. In how many seconds will the projectile strike the ground? (Round your answer to the nearest tenth of a second.) The parametric equations for the path of the projectile are

$$x = (400 \cos 45^\circ)t, \text{ and}$$

$$y = (400 \sin 45^\circ)t - 16t^2.$$

- 13) Ron throws a ball straight up with an initial speed of 40 feet per second from a height of 7 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?

- 14) A baseball pitcher throws a baseball with an initial speed of 135 feet per second at an angle of 20° to the horizontal. The ball leaves the pitcher's hand at a height of 5 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?

- 15) A baseball player hit a baseball with an initial speed of 170 feet per second at an angle of 40° to the horizontal. The ball was hit at a height of 3 feet off the ground. 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 distance the ball traveled?

- 16) Rachel's bus leaves at 6:40 PM and accelerates at the rate of 3 meters per second per second. Rachel, who can run 6 meters per second, arrives at the bus station 4 seconds after the bus has left. Find parametric equations that describe the motions of the bus and Rachel as a function of time. Determine algebraically whether Rachel will catch the bus. If so, when?

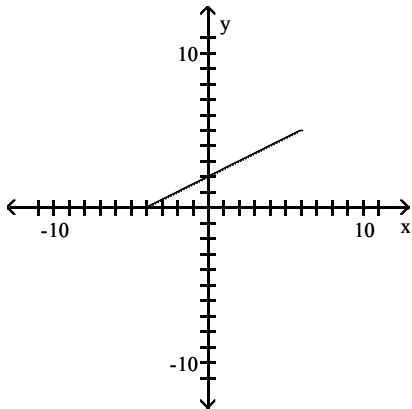
- 17) Determine whether a baseball hit 136 feet per second at an angle of 30° relative to level ground will clear a 10-foot wall 400 feet away.

Answer Key

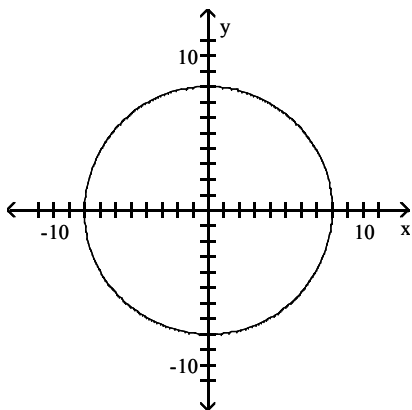
Testname: PRE-CALC-PARAMETRIC PROBLEMS

1) $A = 5, B = 9$

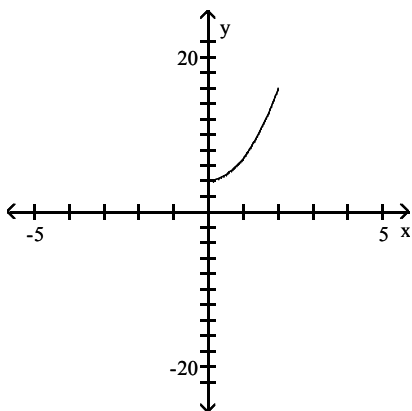
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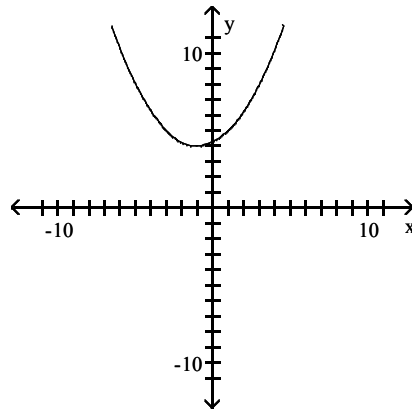
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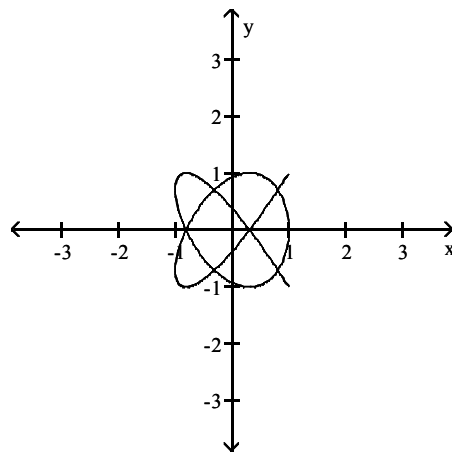
4)



5)



6)



7) $y = x^2 + 6x + 14$

8) $y = \frac{1}{3}x + 3$; for x in $-6 \leq x \leq 9$

9) $y = x - 11$; for x in $-7 \leq x \leq 9$

10) $x^2 + y^2 = 36$; for x in $-6 \leq x \leq 6$

11) $xy = 20$

12) 17.7 seconds

13) $x = 0, y = -16t^2 + 40t + 7$
2.664 sec, 1.25 sec,
32 feet

14) $x = 126.86t, y = -16t^2 + 46.17t + 5$
2.99 sec, 1.443 sec,
38.307 feet

15) $x = 130.22t, y = -16t^2 + 109.31t + 3$
6.859 sec, 3.416 sec,
893.179 feet

16) Bus: $x_1 = \frac{3}{2}t^2, y_1 = 1$; Rachel: $x_2 = 6(t - 4), y_2 = 3$

Rachel won't catch the bus.

17) Yes