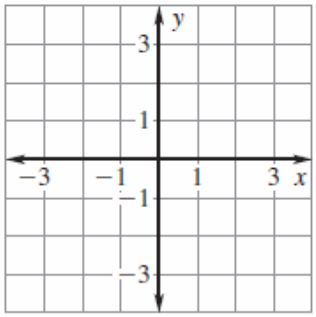
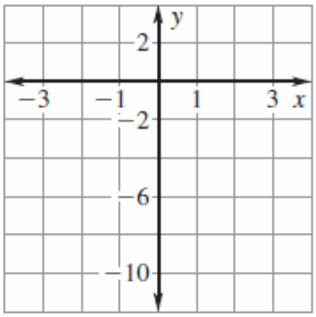
Chapter 10 Review: Please show all work on a separate piece of paper.

Graph the function and identify its domain and range. Compare the graph with the graph of $y = x^2$.

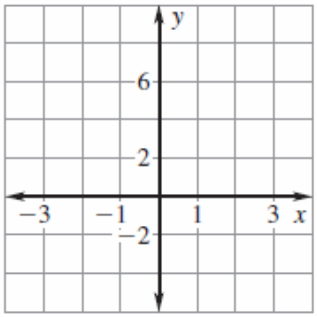
3. $y = \frac{1}{6}x^2 + 2$



4. $y = -4x^2 - 3$



5. $y = 9x^2 - \frac{7}{2}$



Tell whether the graph opens upward or downward. Then find the axis of symmetry and vertex of the graph of the function.

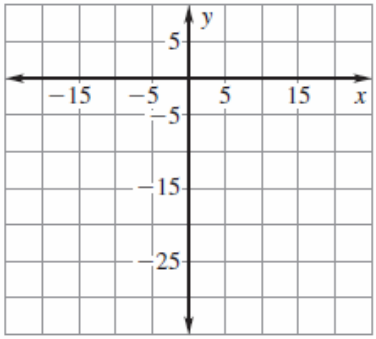
1. $y = -3x^2 + 3x + 5$

2. $y = \frac{5}{2}x^2 - 2x + 1$

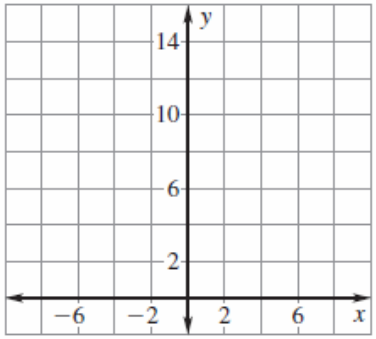
3. $y = 8x^2 - 2x + 3$

Graph the function. Label the vertex and axis of symmetry.

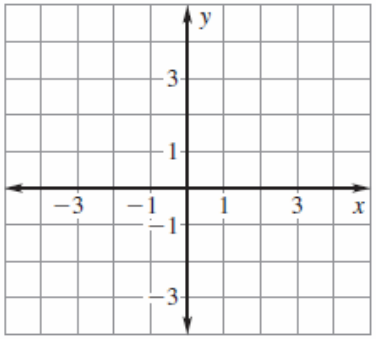
15. $y = -x^2 - 15$



16. $y = 6x^2 + 8$

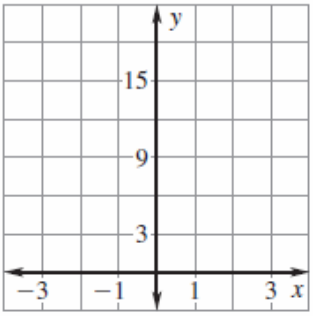


17. $y = -4x^2 + 4x + 3$

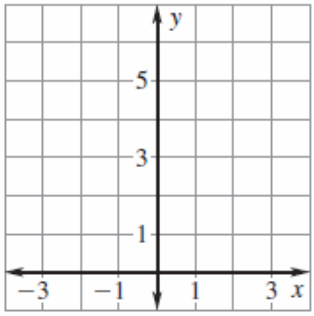


Solve the equation by graphing.

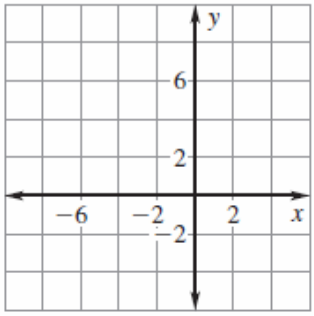
19. $8x^2 + 2x + 3 = 0$



20. $2x^2 + 3x + 1 = 0$



21. $\frac{1}{2}x^2 + 4x + 6 = 0$

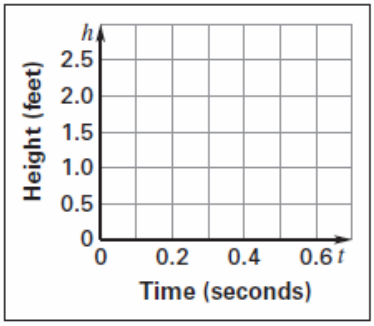


19. Jumping A cat jumps from a countertop 30 inches above the floor. It jumps with an initial vertical velocity of 5 feet per second.

a. Write and graph a function that models the height h (in feet) of the cat t seconds after it jumps. *Explain* how you got your model.

b. How far above the ground is the cat after one half of a second?

c. How long does it take the cat to reach the ground?

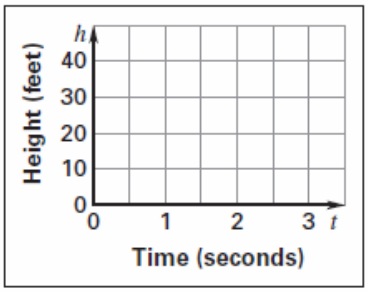


20. Basketball A basketball player throws a ball towards a hoop at a height of 6 feet with an initial vertical velocity of 50 feet per second.

a. Write and graph a function that models the height h (in feet) of the ball t seconds after it is thrown.

b. If the player misses the hoop completely and the ball lands on the ground, how long was the ball in the air?

c. If an opposing player catches the ball at a height of 5 feet, how long was the ball in the air? *Explain* your reasoning.



Solve the equation. Round the solutions to the nearest hundredth.

7. $4x^2 - 8 = 122$

8. $7x^2 - 43 = 34$

9. $2x^2 + 7 = 1$

10. $3x^2 + 23 = 74$

11. $6x^2 - 27 = 9$

12. $5(x - 8)^2 = 15$

13. $4(x + 9)^2 = 24$

14. $\frac{1}{2}(x - 4)^2 = 7$

15. $\frac{3}{4}(x + 7)^2 = 9$

Use the quadratic formula to solve the equation. Round your solutions to the nearest hundredth, if necessary.

1. $15x^2 + 8x + 1 = 0$

2. $4x^2 - 6x + 2 = 0$

3. $9x^2 + 9x - 1 = 0$

4. $x^2 - 6x = 15$

Solve the quadratic equation using any method. Round your solutions to the nearest hundredth, if necessary.

16. $-3x^2 = -18$

17. $x^2 - 5x + 10 = 0$

18. $x^2 + 3x - 1 = 0$

19. $x^2 = 9x - 81$

20. $x^2 + 6x = 10$

21. $-5x^2 + x = 13$

22. $10x^2 - 4 = 6x^2 + 5$

23. $-x^2 - 18 = x^2 + 12x$

24. $(x + 9)^2 = 64$

Tell whether the equation has *two solutions*, *one solution*, or *no solution*.

1. $x^2 + x + 5 = 0$

2. $100x^2 - 36x = 0$

3. $5x^2 + 4 = 6x$

4. $14 = x^2 - 7x$

5. $\frac{1}{3}x^2 + 6 = x$

6. $-4x^2 - 5x = \frac{3}{4}$

7. $9x^2 + 11x + 1 = 5x$

8. $6x^2 + 10 = 3x^2 - 3x + 4$

9. $4x^2 + 4 = 12x - 4x^2$

Find the number of *x*-intercepts that the graph of the function has.

10. $y = 5x^2 + 4x - 1$

11. $y = 3x^2 - 15x + 5$

12. $y = 4x^2 + x + 8$

13. $y = x^2 - 4x - 2$

14. $y = 5x^2 - 10x + 5$

15. $y = -6x^2 + 5x + 3$

16. $y = 6x^2 + 9x + 1$

17. $y = \frac{1}{5}x^2 - 4x - 3$

18. $y = \frac{3}{4}x^2 - 4x + 3$

28. Football You kick a football with an initial upward velocity of 42 feet per second from the ground.

a. Use the vertical motion model to write a function that models the height h (in feet) of the ball after t seconds.

b. Does the ball reach a height of 25 feet? If so, when?