Name _____ Date _____

LESSON 4.5

Practice B

For use with pages 250–255

Simplify the expression.

1. $\sqrt{242}$
2. $\sqrt{153}$
3. $\sqrt{56}$
4. $5\sqrt{24} \cdot 2\sqrt{28}$
5. $\sqrt{8} \cdot 3\sqrt{40} \cdot \sqrt{3}$
6. $\sqrt{10} \cdot \sqrt{14}$
7. $\sqrt{\frac{121}{225}}$
8. $\sqrt{\frac{7}{9}} \cdot \sqrt{\frac{4}{7}}$
9. $\sqrt{24} \cdot \sqrt{\frac{80}{192}}$
10. $\frac{3}{4 + \sqrt{5}}$
11. $\frac{-6}{5 - \sqrt{11}}$
12. $\frac{7 - \sqrt{7}}{10 + \sqrt{3}}$

Solve the equation.

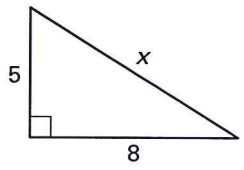
13. $x^2 = 289$
14. $x^2 - 169 = 0$
15. $2x^2 - 512 = 0$
16. $3x^2 - 150 = 282$
17. $\frac{1}{2}x^2 - 8 = 16$
18. $\frac{2}{3}x^2 - 4 = 12$
19. $2x^2 + 5 = 5x^2 - 37$
20. $4(x^2 - 8) = 84$
21. $3(x^2 + 2) = 18$
22. $2(x + 2)^2 = 72$
23. $3(x - 3)^2 + 2 = 26$
24. $(3x + 2)^2 - 49 = 0$
25. $(4x - 5)^2 = 64$
26. $\frac{1}{2}(x - 4)^2 = 8$
27. $\frac{2}{3}(x + 8)^2 - 66 = 0$

When an object is dropped, its height *h* can be determined after *t* seconds by using the falling object model $h = -16t^2 + s$ where *s* is the initial height. Find the time it takes an object to hit the ground when it is dropped from a height of *s* feet.

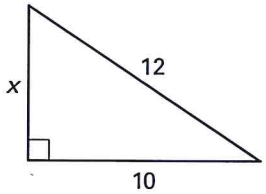
28. $s = 160$
29. $s = 300$
30. $s = 550$
31. $s = 690$
32. $s = 900$
33. $s = 1600$

Use the Pythagorean theorem to find *x*. Round to the nearest hundredth.

34.



35.



36. **Operating Costs** For a period of 48 months, the average monthly operating cost for a small business, C (in dollars), can be approximated by the model $C = 0.55t^2 + 550$, where t is the number of months. During which month was the average operating cost $1430?

Name _____ Date _____

LESSON 4.6

Practice B

For use with pages 259–266

Solve the equation.

1. $x^2 = -36$
2. $x^2 + 121 = 0$
3. $x^2 + 9 = 4$
4. $x^2 = 2x^2 + 4$
5. $3x^2 + 40 = -x^2 - 56$
6. $11x^2 = -5x^2 - 1$
7. $(x - 3)^2 = -12$
8. $-2(x - 1)^2 = 36$
9. $4(x + 2)^2 + 320 = 0$

Write the expression as a complex number in standard form. Identify the real and imaginary parts.

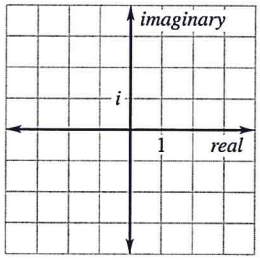
10. $(-4 - i) - (4 + 5i)$
11. $(5 - 3i) + (-3 - 6i)$
12. $3i(4 + 2i)$
13. $-2i(3 - i)$
14. $(2 + i)(4 + 2i)$
15. $(5 - 2i)(1 - 3i)$
16. $(2 - i)^2$
17. $(5 + 3i)(5 - 3i)$
18. $\frac{5}{3 - 2i}$
19. $\frac{2 - i}{3 + 4i}$
20. $\frac{1 + 2i}{\sqrt{2} + i}$
21. $\frac{3}{2 - 4i} - (3 + 2i)$

Find the absolute value of the complex number.

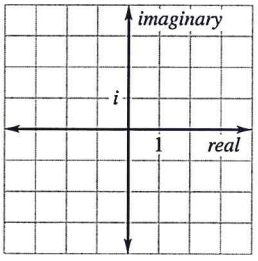
22. $3 - 4i$
23. $1 - i\sqrt{3}$
24. $\sqrt{5} + 2i\sqrt{2}$

Plot the numbers in a complex plane.

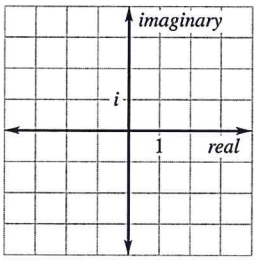
25. $3i$



26. $2 + 2i$



27. $-2 - 3i$



Using the properties of exponents, write the complex number in standard form.

28. $2 + i^2$
29. $3 + i^3$
30. $5 - i^4$
31. $2 - i^5$
32. $1 + i^4$
33. $1 + i^8$
34. $1 + i^{12}$
35. $1 + i^{16}$

36. **Pattern Recognition** Using the information from Exercises 32–35, write a general statement about the value of i^n where n is a positive factor of 4. Use this statement to write $2 + i^{207}$ in standard form.

Name _____ Date _____

LESSON 4.7

Practice B

For use with pages 268–275

Solve the equation by finding square roots.

1. $x^2 + 8x + 16 = 9$
2. $x^2 - 6x + 9 = 25$
3. $x^2 - 12x + 36 = 49$
4. $2x^2 - 12x + 18 = 32$
5. $4x^2 - 4x + 1 = 36$
6. $5x^2 - 20x + 20 = 35$
7. $x^2 - \frac{2}{3}x + \frac{1}{9} = 1$
8. $x^2 + \frac{3}{2}x + \frac{9}{16} = 3$
9. $9x^2 + 12x + 4 = 5$

Find the value of *c* that makes the expression a perfect square trinomial. Then write the expression as a square of a binomial.

10. $x^2 + 8x + c$
11. $x^2 - 22x + c$
12. $x^2 + 16x + c$
13. $x^2 + 3x + c$
14. $x^2 - 9x + c$
15. $9x^2 - 12x + c$

Solve the equation by completing the square.

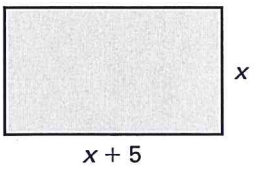
16. $x^2 + 4x = 1$
17. $x^2 - 10x = -10$
18. $x^2 - 2x - 9 = 0$
19. $x^2 + 6x + 10 = 0$
20. $x^2 + 8x + 4 = 0$
21. $3x^2 + 36x = -42$
22. $x^2 - 24x + 81 = 0$
23. $4x^2 + 20x + 25 = 0$
24. $3x^2 - 3x + 9 = 0$
25. $6x^2 - 12x - 18 = 0$

Write the quadratic function in vertex form. Then identify the vertex.

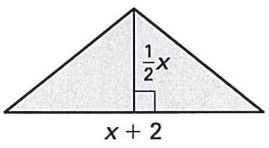
26. $y = x^2 + 14x + 11$
27. $y = x^2 - 8x + 10$
28. $y = 2x^2 + 4x - 5$
29. $y = 3x^2 - 9x + 18$

Find the value of *x*.

30. Area of rectangle = 84



31. Area of triangle = 20



32. **Shot Put** In a track and field event, a contestant had a throw in the shot put that can be modeled by $y = -0.02x^2 + x + 6$ where x is the shot put's horizontal distance (in feet) and y is the corresponding height (in feet). How long was the throw? Round the answer to the nearest tenth.

Name _____ Date _____

LESSON 4.8

LESSON 4.8 Practice B

For use with pages 278–285

Find the discriminant of the quadratic equation.

1. $x^2 - 3x + 5 = 0$
2. $2x^2 + x + 2 = 0$
3. $4x^2 - 9x + 2 = 0$
4. $-3x^2 + 6x - 3 = 0$
5. $3x^2 + 3x - 1 = 0$
6. $7x^2 - 4x + 5 = 0$

Find the discriminant and use it to determine if the solution has *one real*, *two real*, or *two imaginary* number(s).

7. $x^2 + 4x + 3 = 0$
8. $x^2 - 2x + 4 = 0$
9. $x^2 - 2x + 1 = 0$
10. $3x^2 + 2x - 1 = 0$

Tell whether the equation *always*, *sometimes*, or *never* has two real solutions. In Exercise 12, let *n* be any integer.

11. $(x - 4)(-x + 4) = 0$
12. $x^2 + nx - 1 = 0$

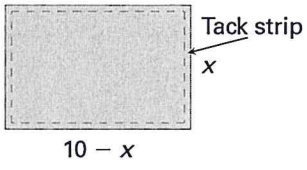
Use the quadratic formula to solve the equation.

13. $x^2 + 4x - 2 = 0$
14. $2x^2 - 5x - 2 = 0$
15. $x^2 + 2x = 4x$
16. $-6x^2 + 3x + 2 = 3$
17. $-x^2 + 1 = -5x^2 + 4x$
18. $2(x - 3)^2 = -2x + 9$
19. $2.5x^2 - 2.8x = 0.4$
20. $4.8x^2 = 5.2x + 2.7$

Solve the equation using the quadratic formula. Then solve the equation by factoring to check your solution(s).

21. $x^2 - 2x - 24 = 0$
22. $x^2 - 2x + 1 = 0$
23. $2x^2 - 9x + 9 = 0$
24. $6x^2 + 17x + 5 = 0$
25. $10x^2 + x = 2$
26. $6x^2 = 5x + 6$

27. **New Carpet** You have new carpeting installed in a rectangular room. You are charged for 28 square yards of carpet and 60 feet (20 yards) of tack strip. Tack strip is used along the perimeter to secure the carpet in place. Do you think these figures are correct? Explain your answer.



In Exercises 28–31, use the following information.

Launched Object An object is launched upward with an initial velocity of 64 feet per second from a platform 80 feet high.

28. Write a height model for the object.
29. How many seconds until the maximum height is reached?
30. What will be the maximum height?
31. How many seconds until the object hits the ground?

Name _____ Date _____

LESSON 4.9

Practice B

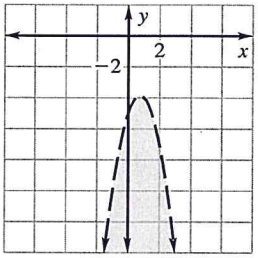
For use with pages 286–293

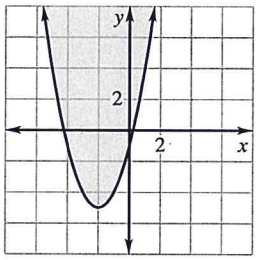
Determine whether the ordered pair is a solution of the inequality.

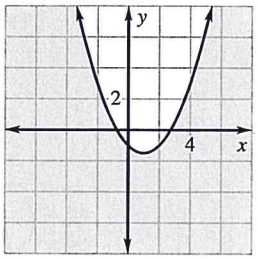
1. $y < x^2 + 2x + 2, (1, 6)$
2. $y > x^2 - 5x, (2, -3)$
3. $y \leq 2x^2 - 7x, (4, 4)$
4. $y \geq -2x^2 + 3x - 6, (-1, -12)$

Match the inequality with its graph.

5. $y \geq x^2 + 4x - 1$
6. $y < -2x^2 + 3x - 5$
7. $y \leq \frac{1}{2}x^2 - x - 1$

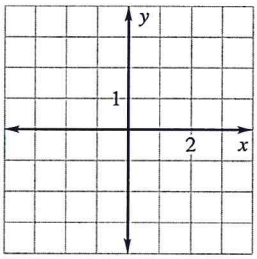
A. 

B. 

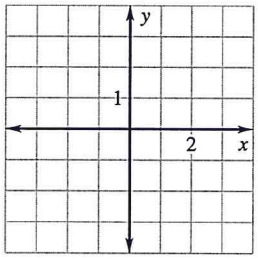
C. 

Graph the inequality.

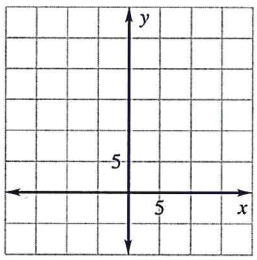
8. $y \geq x^2 - 2$



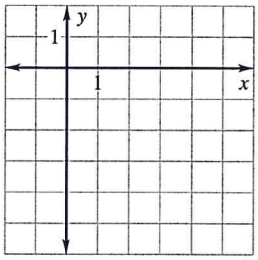
9. $y < -x^2 - 2x + 1$



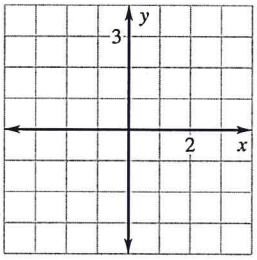
10. $y \leq x^2 - 3x + 15$



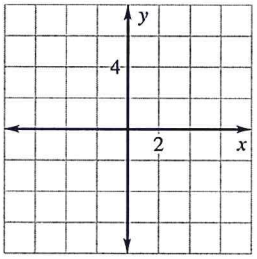
11. $y > 3x^2 - 8x$



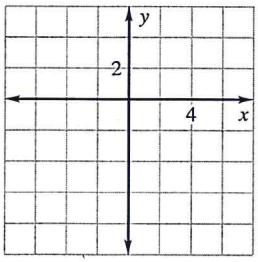
12. $y < -6x^2 + 2x + 3$



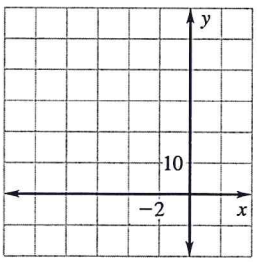
13. $y \geq 4x^2 - x - 7$



14. $y \geq x^2 + 2x - 8$



15. $y > -2x^2 - 14x + 21$



16. $y \leq 5x^2 + 2x - 6$