Name_____ Class _____ Date _____

4-6 Practice

Form G

Completing the Square

Solve each equation by finding square roots.

1. $3x^2 = 75$

2. $5x^2 - 45 = 0$

3. $4x^2 - 49 = 0$

4. $6x^2 = 216$

5. $2x^2 = 14$

6. $3x^2 - 96 = 0$

7. A box is 4 in. high. Its length is 1.5 times its width. The volume of the box is 1350 in.^{2}. What are the width and length of the box?

Solve each equation.

8. $x^2 + 12x + 36 = 25$

9. $x^2 - 10x + 25 = 144$

10. $x^2 + 6x + 9 = \frac{49}{4}$

11. $x^2 - 22x + 121 = 225$

12. $16x^2 + 8x + 1 = 16$

13. $25x^2 - 30x + 9 = 81$

Complete the square.

14. $x^2 + 22x +$

15. $x^2 - 30x +$

16. $x^2 + 5x +$

17. $x^2 - \frac{1}{2}x +$

18. $25x^2 + 10x +$

19. $4x^2 - 12x +$

Solve each quadratic equation by completing the square.

20. $x^2 + 10x - 1 = 0$

21. $x^2 + 2x - 7 = 0$

22. $-x^2 + 6x + 10 = 0$

23. $x^2 + 5x = 3x + 11$

24. $3x^2 + 4x = 2x^2 + 3$

25. $x^2 - 2x - \frac{3}{4} = 0$

26. $-0.2x^2 + 0.4x + 0.8 = 0$

27. $4x^2 + 20x + 1 = 0$

Name _____ Class _____ Date _____

4-6 Practice (continued) Form G

Completing the Square

Rewrite each equation in vertex form.

28. $y = x^2 - 6x + 4$

29. $y = x^2 + 14x + 50$

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

31. $y = -2x^2 + 6x - 2$

Find the value of k that would make the left side of each equation a perfect square trinomial.

32. $x^2 + kx + 196 = 0$

33. $64x^2 - kx + 1 = 0$

34. $x^2 - kx + 16 = 0$

35. $4x^2 - kx + 9 = 0$

36. $16x^2 + kx + 9 = 0$

37. $\frac{1}{4}x^2 - kx + \frac{1}{25} = 0$

38. The quadratic function $d = -t^2 + 4t + 33$ models the depth of water in a flood channel after a rainstorm. The time in hours after it stops raining is t and d is the depth of the water in feet.

a. Solve the equation $-t^2 + 4t + 33 = 0$.

b. Approximate the positive solution found in part (a) to two decimal places.

c. Interpret the answer to part (b) in terms of the problem.

39. While in orbit, a space scientist measures the pressure inside a container as it is being heated and then cooled. She records the information and discovers the pressure p, in pounds per square inch, is related to the time t in minutes after the experiment begins according to the equation $p = -0.2t^2 + 1.6t$.

a. Complete the square in the expression $-0.2t^2 + 1.6t$.

b. Rewrite the equation for p in vertex form.

c. What is a reasonable domain for this function? Explain.

d. When does the maximum pressure occur? What is the maximum pressure?