Name: Date:
Instructor: Section:

Practice Set 8.2

Use the choices to fill in each blank.

0	2	quadratic formula
1	3	discriminant

1. $b^2 - 4ac$ is called the _____.

2. $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ is called the _____.

3. If the discriminant equals 0, the quadratic equation has _____ real solution(s).

4. If the discriminant is negative, the quadratic equation has _____ real solution(s).

Use the discriminant to determine whether each equation has two real solutions, one real solution, or no real solution.

5. $x^2 + 3x + 5 = 0$

6. $2x^2 + 9x = -7$

7. $-a^2 + 2a + 5 = 0$

8. $\dfrac{1}{4}x^2 - \dfrac{3}{4}x + \dfrac{9}{16} = 0$

5. _____

6. _____

7. _____

8. _____

Solve each equation by using the quadratic formula.

9. $x^2 - 3x - 28 = 0$

10. $6x^2 - x - 12 = 0$

11. $-a^2 - 5a + 50 = 0$

12. $b^2 - 36 = 0$

13. $4x^2 - 20x + 25 = 0$

14. $x^2 - 3x = 0$

15. $x^2 + x - 11 = 0$

16. $x^2 - 3x + 15 = 0$

17. $3x^2 + 2x + 1 = 0$

18. $5x^2 - 4x - 11 = 0$

19. $0.2x^2 + 1.3x - 0.5 = 0$

20. $2b^2 - \dfrac{2}{5}b + \dfrac{3}{5} = 0$

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

For each function, determine all real values of the variable for which the function has the indicated value.

21. $f(x) = x^2 - 2x - 10,\ f(x) = 5$

22. $f(x) = 3x^2 + 5x - 1,\ f(x) = 7$

21. _____

22. _____

Determine an equation that has the given solutions.

23. 3, 5

24. 2

25. 4, –4

26. 0, –4

27. 7, –4

28. $\frac{2}{3}, -\frac{3}{2}$

29. $\sqrt{7},\ -\sqrt{7}$

30. $4i, -4i$

31. $5+\sqrt{3},\ 5-\sqrt{3}$

32. $3 + 4i, 3 - 4i$

23._____

24._____

25._____

26._____

27._____

28._____

29._____

30._____

31._____

32._____

Problem Solving

33. Ida Heinze sells r handmade rugs, $r \leq 100$, at a price of $(25 - 0.05r)$ dollars per rug. How many rugs must be sold to have a revenue of \$1413.75?

33._____

34. Three times the square of a positive number increased by 2 times the number is 16. Find the number.

34._____

35. Mike Williams wishes to fence in a rectangular region for the dogs at his veterinary clinic. If he only has 500 feet of fencing and wishes to enclose an area of 15,000 square feet, find the dimensions of the rectangular region.

35._____

36. The acceleration due to gravity on Mars is –3.79 m/sec^2. Suppose that in the future an astronaut on Mars jumps upward with an initial velocity of 10 m/s from the top of a 12-meter hill. How long will it take to land on the ground below the hill? Use the formula $h = \frac{1}{2}gt^2 + v_0t + h_0$, where g is the acceleration due to gravity, t is the time in seconds, v_0 is the initial velocity in meters, and h_0 is the height of the object in meters above the ground.

36._____

Challenge

37. A metal ball expands when heated. If the radius increases by 0.10 millimeter after being heated and the total volume increases by 32 mm^3, find the original radius of the ball. $\left(V = \frac{4}{3}\pi r^3\right)$

37._____

