LESSON 2.13

Exercise Set A

MM1A3a Solve quadratic equations in the form $ax^2 + bx + c = 0$, where $a = 1$, by using factorization and finding square roots where applicable.

Solve the equation.

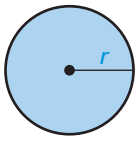
1. $6x^2 - 24 = 0$
2. $8x^2 - 128 = 0$
3. $x^2 - 13 = 23$
4. $3x^2 - 60 = 87$
5. $2x^2 - 33 = 17$
6. $5x^2 - 200 = 205$
7. $4x^2 - 125 = -25$
8. $7x^2 - 50 = 13$
9. $\frac{1}{2}x^2 - \frac{1}{2} = 0$

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

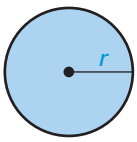
10. $x^2 + 15 = 23$
11. $x^2 - 16 = -13$
12. $12 - x^2 = 17$
13. $3x^2 - 8 = 7$
14. $9 - x^2 = 9$
15. $4 + 5x^2 = 34$
16. $48 = 14 + 2x^2$
17. $8x^2 = 50$
18. $3x^2 + 23 = 18$
19. $(x - 3)^2 = 5$
20. $(x + 2)^2 = 10$
21. $3(x - 4)^2 = 18$

Use the given area *A* of the circle to find the radius *r* or the diameter *d* of the circle. Round the answer to the nearest hundredth, if necessary.

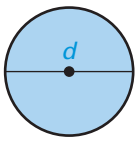
22. $A = 169\pi$ m^2



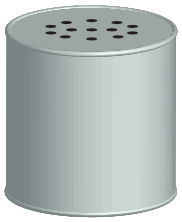
23. $A = 38\pi$ in.^{2}



24. $A = 45\pi$ cm^2



25. **Flower Seed** A manufacturer is making a cylindrical can that will hold and dispense flower seeds through small holes in the top of the can. The manufacturer wants the can to have a volume of 42 cubic inches and be 6 inches tall. What should the diameter of the can be? (*Hint:* Use the formula for volume, $V = \pi r^2 h$, where V is the volume, r is the radius, and h is the height.) Round your answer to the nearest inch.



26. **Stockpile** You can find the diameter D (in feet) of a conical pile of sand, dirt, etc., by using the formula $V = 0.2618hD^2$ where h is the height of the pile (in feet) and V is the volume of the pile (in cubic feet). Find the diameter of each stockpile in the table. Round your answers to the nearest foot.

Stockpile	Height (ft)	Diameter (ft)	Volume (ft^3)
A	10	?	68
B	15	?	230
C	20	?	545

UNIT 2

LESSON 2.13

Exercise Set B

MM1A3a Solve quadratic equations in the form $ax^2 + bx + c = 0$, where $a = 1$, by using factorization and finding square roots where applicable.

Solve the equation.

1. $4x^2 - 29 = 7$ **2.** $2x^2 - 50 = 48$ **3.** $5x^2 - 120 = -40$

4. $\frac{1}{2}x^2 - 2 = 0$ **5.** $\frac{1}{3}x^2 - 8 = 4$ **6.** $0.1x^2 - 6.4 = 0$

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

16. $\frac{2}{5}(x - 4)^2 = 16$ **17.** $7x^2 - 34 = 2x^2 + 16$ **18.** $24 = 3(x^2 + 7)$

19. $9x^2 + 3 = 4(3x^2 - 6)$ **20.** $\left(\frac{x - 4}{5}\right)^2 = 36$ **21.** $(16x^2 - 8)^2 = 81$

Solve the equation without graphing.

22. $x^2 + 6x + 9 = 16$ **23.** $x^2 - 4x + 4 = 100$ **24.** $x^2 - 10x + 25 = 121$

25. $2x^2 - 28x + 98 = 72$ **26.** $-3x^2 + 6x - 3 = -27$ **27.** $\frac{1}{2}x^2 + 4x + 8 = 8$

28. Speed To estimate the speed s (in feet per second) of a car involved in an accident, investigators use the formula $s = \frac{11}{2}\sqrt{\frac{3}{4}\ell}$ where ℓ represents the length (in feet) of tire skid marks on the pavement. After an accident, an investigator measures skid marks that are 180 feet long. Approximately how fast was the car traveling?

29. Doyle Log rule The Doyle log rule is a formula used to estimate the amount of lumber that can be sawn from logs of various sizes. The amount of lumber V (in board feet) is given by $V = \frac{L(D - 4)^2}{16}$ where L is the length (in feet) of a log and D is the small-end diameter (in inches) of the log. Solve the formula for D. Then use the rewritten formula to find the diameters, to the nearest tenth of a foot, of logs that will yield 60 board feet and have the following lengths: 16 feet, 20 feet, 25 feet, and 32 feet.

30. Multiple Representations A ride at an amusement park lifts seated riders 240 feet straight above the ground. Then the riders are dropped. They experience free fall until the brakes are activated at 90 feet above the ground.

a. Writing an Equation Use the vertical motion model to write an equation for the height h (in feet) of the riders as a function of the time t (in seconds) into the free fall.

b. Making a Table Make a table that shows the height of the riders after 0, 1, 2, 3, and 4 seconds. Use the table to estimate the amount of time the riders experience free fall.

c. Interpreting an Equation Use the equation to find the amount of time, to the nearest tenth of a second, that the riders experience free fall.