

Square Roots

Extra Practice

9.2

Name _____

In 1–12, solve the equation.

1. $x^2 = 49$

2. $x^2 = 64$

3. $3x^2 = 300$

4. $8x^2 = 128$

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

6. $\frac{1}{4}x^2 = 9$

7. $25x^2 = 4$

8. $x^2 + 11 = 12$

9. $x^2 - 56 = 25$

10. $3x^2 + 10 = 37$

11. $\frac{1}{2}x^2 - 16 = 34$

12. $4x^2 - 59 = 62$

In 13–24, use a calculator to solve the equation. Round the results to two decimal places.

13. $x^2 = 35$

14. $x^2 = 12$

15. $x^2 + 8 = 13$

16. $x^2 - 5 = 21$

17. $x^2 + 20 = 37$

18. $x^2 - 10 = -3$

19. $3x^2 - 31 = 2$

20. $\frac{3}{5}x^2 - 8 = 26$

21. $4x^2 + 8 = 19$

22. $\frac{1}{2}x^2 + 6 = 9$

23. $2x^2 - 22 = 51$

24. $\frac{1}{5}x^2 - 11 = 13$

Key Features - LOS 3: Vertex

Extra Practice

9.3

Name _____

In 1–12, decide whether the graph of the equation opens up or down. Then find the coordinates of the vertex.

1. $y = 3x^2$

2. $y + 2x^2 = 0$

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

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

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

6. $y = -2x^2 - 8x$

7. $y = x^2 + 6x + 2$

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

9. $y = 3x^2 - 12x - 2$

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

11. $y - x^2 = 2x + 4$

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

In 13–24, sketch the graph of the equation. (Label the vertex.)

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

14. $y = x^2 + 6x + 5$

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

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

17. $y = 2x^2 - x - 1$

18. $y = x^2 - 6x + 10$

19. $y = -2x^2 - 8x + 20$

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

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

22. $y = -\frac{1}{3}x^2 + 4x - 7$

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

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

Quadratic Formula

Extra Practice

9.4

Name _____

In 1–12, use the quadratic formula to solve the equation.

- | | | |
|-------------------------|--------------------------|--------------------------|
| 1. $x^2 - 8x + 15 = 0$ | 2. $x^2 + 11x + 18 = 0$ | 3. $2x^2 + 3x - 2 = 0$ |
| 4. $4x^2 - 7x + 3 = 0$ | 5. $8x^2 + 26x - 15 = 0$ | 6. $x^2 + 3x - 5 = 0$ |
| 7. $x^2 - 7x + 1 = 0$ | 8. $3x^2 + 8x + 2 = 0$ | 9. $3x^2 + x - 6 = 0$ |
| 10. $2x^2 - 5x - 8 = 0$ | 11. $5x^2 - 3x - 5 = 0$ | 12. $7x^2 - 21x + 8 = 0$ |

In 13–24, find the x-intercepts of the graph of the equation.

- | | | |
|--------------------------|--------------------------|--------------------------|
| 13. $y = x^2 + 2x - 8$ | 14. $y = 2x^2 - 5x - 3$ | 15. $y = 6x^2 - x - 12$ |
| 16. $y = x^2 + 2x + 8$ | 17. $y = 3x^2 + 5x + 1$ | 18. $y = 5x^2 + 50x + 1$ |
| 19. $y = 2x^2 - 18x - 3$ | 20. $y = 4x^2 + 11x - 2$ | 21. $y = 2x^2 - x + 13$ |
| 22. $y = x^2 + 3x + 1$ | 23. $y = 7x^2 - 12x + 4$ | 24. $y = 3x^2 + 2x - 34$ |

Discriminant

Extra Practice

9.5

Name _____

In 1–12, decide how many solutions the equation has.

- | | | |
|---------------------------|---------------------------|--------------------------|
| 1. $x^2 + 2x + 1 = 0$ | 2. $2x^2 - 5x - 3 = 0$ | 3. $x^2 + 4x - 2 = 0$ |
| 4. $x^2 + 2x + 6 = 0$ | 5. $2x^2 + x - 15 = 0$ | 6. $-3x^2 + 4x + 1 = 0$ |
| 7. $2x^2 - x + 16 = 0$ | 8. $4x^2 + 12x + 9 = 0$ | 9. $25x^2 - 10x + 1 = 0$ |
| 10. $12x^2 - 19x + 5 = 0$ | 11. $6x^2 + 25x + 21 = 0$ | 12. $3x^2 - 5x + 4 = 0$ |

Factoring : Mixed Review

Extra Practice

10.6

Name _____

In 1-12, solve the equation by factoring.

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

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

3. $3x^2 + 9x - 12 = 0$

4. $6x^2 - 10x - 4 = 0$

5. $6x^2 - 27x + 27 = 0$

6. $3x^2 + 5x + 2 = 0$

7. $8x^2 + 10x + 3 = 0$

8. $4x^2 - 8x - 5 = 0$

9. $12x^2 - 5x - 3 = 0$

10. $15x^2 + 16x - 15 = 0$

11. $8x^2 - 22x + 5 = 0$

12. $6x^2 + 5x + 1 = 0$

In 13-24, solve the equation by finding square roots, by the quadratic formula, or by factoring.

13. $4x^2 - 9 = 0$

14. $x^2 + 6x = 0$

15. $x^2 - 4x + 1 = 0$

16. $x^2 + 21 = 10x$

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

18. $2x^2 - 3x - 4 = 0$

19. $2x^2 = 16x$

20. $2x^2 + 12x + 10 = -8$

21. $2x^2 - x = 6$

22. $12x^2 + x - 1 = 0$

23. $2x^2 + 7x = 4$

24. $2x^2 + 3x + 5 = 8$

Completing the Square : Mixed Review

Extra Practice

10.7

Name _____

In 1-12, solve the equation by completing the square.

1. $x^2 + 10x - 4 = 0$

2. $x^2 + 6x - 1 = 0$

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

4. $x^2 - 6x - 8 = 0$

5. $x^2 + 12x - 3 = 0$

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

7. $x^2 - 10x + 4 = 0$

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

9. $2x^2 + 8x - 6 = 0$

10. $2x^2 - 16x + 4 = 0$

11. $3x^2 + 12x - 6 = 0$

12. $5x^2 - 10x - 20 = 0$

In 13-24, use the most convenient method to solve the equation.

13. $x^2 - 7x + 12 = 0$

14. $9x^2 - 27x = 0$

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

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

17. $9x^2 + 2 = 27$

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

22. $6x^2 + 8x + 3 = 10$

20. $3x^2 + 4x - 2 = 0$

21. $5x^2 - x - 2 = 0$

22. $6x^2 + 11x = -3$

23. $x^2 - 20x + 60 = 0$

24. $x^2 + 5 = 7x$

Simplifying Radicals

Extra Practice

13.2

Name _____

In 1-12, simplify the radical expression.

1. $\sqrt{80}$

2. $\sqrt{98}$

3. $\sqrt{54}$

4. $\sqrt{\frac{16}{25}}$

5. $3\sqrt{\frac{1}{9}}$

6. $\sqrt{\frac{3}{25}}$

7. $\sqrt{\frac{20}{49}}$

8. $2\sqrt{\frac{18}{36}}$

9. $\sqrt{\frac{4}{8}}$

10. $\sqrt{\frac{64}{18}}$

11. $5\sqrt{\frac{1}{3}}$

12. $\sqrt{\frac{8}{27}}$

In 13-24, perform the indicated operation and simplify your result.

13. $\sqrt{6} \cdot \sqrt{3}$

14. $\sqrt{14} \cdot \sqrt{6}$

15. $\sqrt{5} \cdot \sqrt{10}$

16. $(3\sqrt{7})^2$

17. $(\frac{1}{3}\sqrt{5})^2$

18. $(2\sqrt{10})^2$

19. $(\frac{3}{4}\sqrt{8})^2$

20. $\frac{5}{\sqrt{3}}$

21. $\frac{8}{\sqrt{2}}$

22. $\frac{\sqrt{3}}{\sqrt{5}}$

23. $\frac{1}{\sqrt{20}}$

24. $\frac{3\sqrt{6}}{\sqrt{3}}$