

- GET ORGANIZED. Successful studying begins with being organized.
- GET SERIOUS.
- It is YOUR RESPONSIBILITY to successfully demonstrate your algebra skills to the best of your ability.

Chapter 8: Exponents

1. Write $(\sqrt[3]{x})^5$ in rational exponent notation.

2. Write $y^{\frac{7}{2}}$ in radical notation.

Simplify the expression.

3. $100^{\frac{3}{2}}$

4. $121^{\frac{-1}{2}}$

5. $216^{\frac{2}{3}}$

6. $27^{\frac{1}{3}}$

7. $6^{\frac{1}{2}} \cdot 6^{\frac{3}{2}}$

8. $\frac{8^{\frac{1}{2}}}{8^{\frac{1}{6}}}$

Simplify.

9. $(3x^3y^2)(-5x^4y^6)$

10. $(2y^2z^3)^4$

11. $a^3 \cdot a^6$

12. $(-5a^2b)(3a^4)$

13. $(2ab^2c^3)^4$

14. $(x^4)^3$

15. $(3p^3)^2 + 6p - (-2p^2)^3$

16. $(5m^3)^3 + (6m)^2$

17. $(12y)^2 + 7x^2y - 8y^2 + (11y)x^2$

18. $(x^4)(x^3)$

19. $y^{-3} \cdot y^3$

20. $\frac{x^5}{x^3}$

$$21. \frac{10a^{10}b^5}{2a^{11}b^2}$$

$$22. \frac{64x^4y^{-3}z^{-1}}{16x^{-2}yz^3}$$

$$23. \left(\frac{3x^2 5x}{5x} \right)^0$$

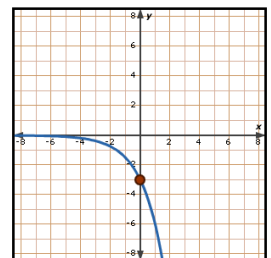
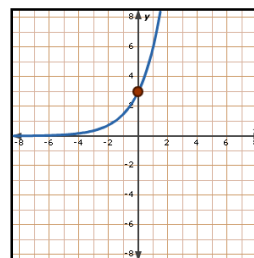
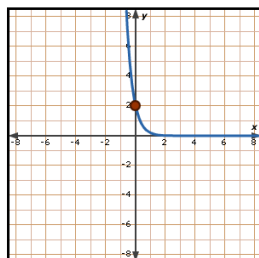
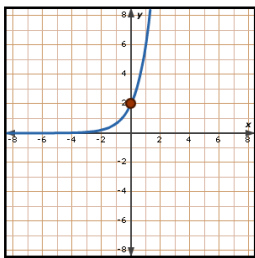
$$24. \frac{15x^3y^2z^4}{10x^4y^4z^2}$$

$$25. \frac{3y^3}{5} \cdot \left(\frac{10x^7}{9y^8} \right)^2$$

$$26. \left(\frac{3x^5}{10y^2} \right)^3 \cdot \frac{5}{x^4}$$

$$27. \frac{-3a^{-4}b^7}{21a^2b^7c^{-5}}$$

28. Identify each picture as growth or decay. Then identify the graph of exponential growth $y = 3 \cdot 2^x$



Write a rule for the following functions.

29.

x	-2	-1	0	1	2
y	$-\frac{1}{16}$	$-\frac{1}{4}$	-1	-4	-16

30.

x	-2	-1	0	1	2
y	25	5	1	$\frac{1}{5}$	$\frac{1}{25}$

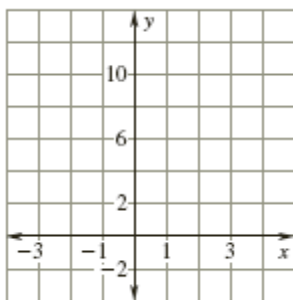
Circle whether the function represents exponential growth and decay. Graph the function. Identify its domain and range.

31. $y = 2 \cdot \left(\frac{1}{5}\right)^x$ Growth/Decay

32. $y = -3 \cdot 6^x$ Growth/Decay

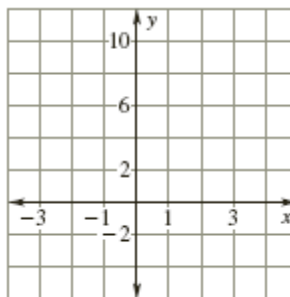
x	-2	-1	0	1	2
y					

x	-2	-1	0	1	2
y					



D: _____

R: _____



D: _____

R: _____

Chapter 9: Factoring

Use the next polynomial to answer #1: $3x - 4x^5 - 12 + 5x^3$

1. (a) Is the polynomial in order? If not, put it in order.

1a. _____

(b) What is the leading coefficient of the polynomial?

1b. _____

(c) What is the degree of the polynomial?

1c. _____

Simplify.

2. $(h^2 + 4h - 4) + (5h^2 - 8h + 2)$

3. $(9b^3 - 13b^2 + b) - (-13b^3 - 5b + 14)$

4. $(5x^2 - x - 7) + (2x^2 + 3x + 4)$

5. $(5x^2 + 16x - 9) - (3x^2 - 4x + 1)$

6. $z^2(4z^4 + z^3 - 11z^2 - 6)$

7. $-10pq(3pq + 4p - 5q^2)$

8. $(x + 2)(x - 3)$

9. $(a - 6)^2$

10. $(2x - y)(2x + y)$

11. $(7y - 4)(2y + 5)$

12. $(2x - 4)(x + 2)$

13. $(3y - 5)^2$

14. $3(x + 4)^2$

15. $(3k - 1)(4k + 9)$

16. $(5x - 9)(3x - 4)$

Factor.

17. $8a^2b^3 + 10ab^2$

18. $20xy - 100x^2y^2$

19. $y^2 - 64$

20. $2x^2 - 200$

21. $x^2 - 5x + 6$

22. $9x^2 - 30x + 25$

23. $16x^2 + 8x + 1$

24. $2x^2 - 4x + 18$

25. $6a^2 - 10a - 4$

26. $a^2 - 12a + 27$

27. $-2h^2 + 5h + 3$

28. $y^3 + y - 9y^2 - 9$

29. $5n^3 - 4n^2 + 25n - 20$

Solve the equation by factoring.

30. $(3x - 2)(x + 5) = 0$

31. $x^2 - 10x + 21 = 0$

32. $x^2 - 5x = 14$

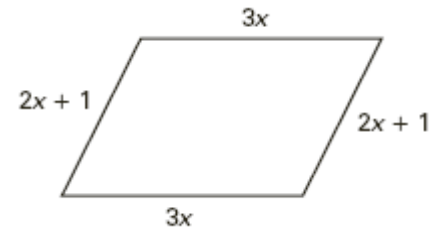
Solve: 33. $3a^2 = 4a$

34. $m^2 + 22m = -23m$

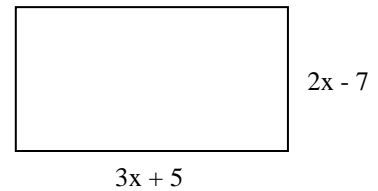
35. $s(s - 1) = 72$

36. Find the zeros of the function: $f(x) = 3x^3 + 18x^2 + 24x$

37. Find a polynomial that represents the PERIMETER of the figure.



38. Find a polynomial that represents the AREA of the figure.



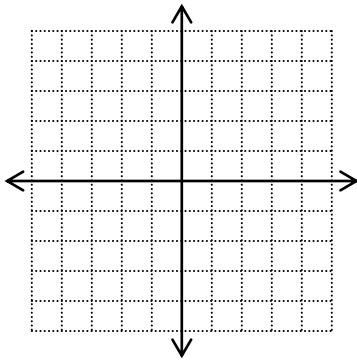
39. The product of twice a number increased by five, and three times a number decreased by two is zero. Find the number(s).

40. The area of a rectangular living room is 40 square feet. The length of the room is 3 ft longer than the width. Find the dimensions of the room.

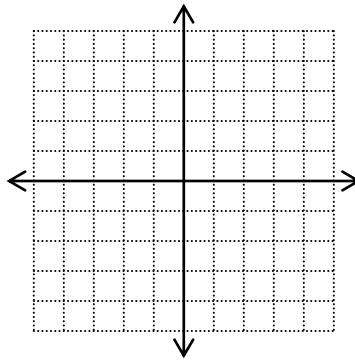
Chapter 10: Quadratics

Graph and compare to the parent function: $y = x^2$

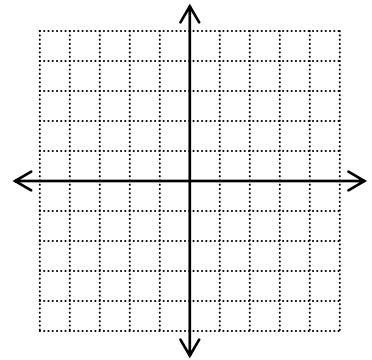
1. $y = -2x^2$



2. $y = \frac{3}{8}x^2$



3. $y = x^2 - 5$



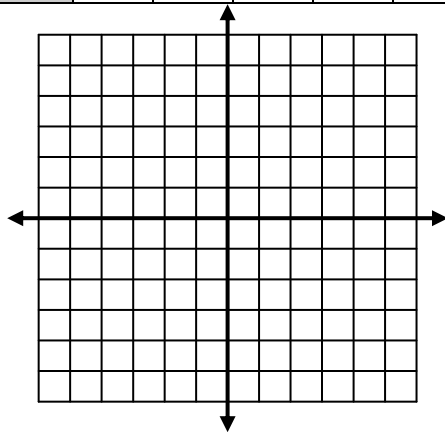
Fill in the following missing information and graph!

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

5. $y = x^2 + 6x + 8$

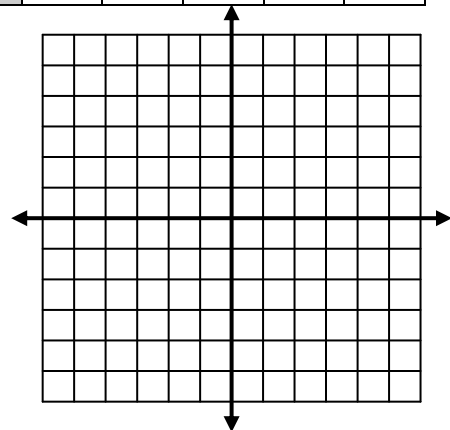
Opens _____	Opens _____
Axis of Symmetry _____	Axis of Symmetry _____
Vertex (____, ____)	Vertex (____, ____)
Maximum or Minimum Value _____	Maximum or Minimum Value _____
y-intercept: (____, ____)	y-intercept: (____, ____)

x					
y					



Solution(s): _____

x					
y					



Solution(s): _____

Solve the following equations using square roots. Leave your answers in radical form when necessary!

6. $x^2 + 6 = 13$

7. $14 - x^2 = 17$

8. $6(x + 8)^2 = 18$

Given the following equations, find the solutions/roots/zeros by completing the square.

9. $x^2 + 2x = 3$

10. $c^2 - 14c = 15$

11. $x^2 - 8x = 9$

Convert the quadratic to vertex form: $y = a(x - h)^2 + k$. Identify the vertex and axis of symmetry.

12. $y = x^2 + 8x + 15$

13. $y = x^2 - 12x + 36$

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

Axis of Symmetry: _____

Axis of Symmetry: _____

Axis of Symmetry: _____

Vertex: (____, ____)

Vertex: (____, ____)

Vertex: (____, ____)

Given the following equations: a) Find the value of the Discriminant; b) Tell whether the equation has two real solutions, one real solution, or no real solutions.

15. $3x^2 + 6x + 2 = 0$

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

17. $2x^2 + 3x + 5 = 0$

15a. _____

16a. _____

17a. _____

15b. _____

16b. _____

17b. _____

Solve the following equations by using the quadratic formula.

18. $5x^2 + 2x - 3 = 0$

19. $2x^2 - 3x = -5$

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

Tell if the each table is linear, exponential or quadratic.

21.

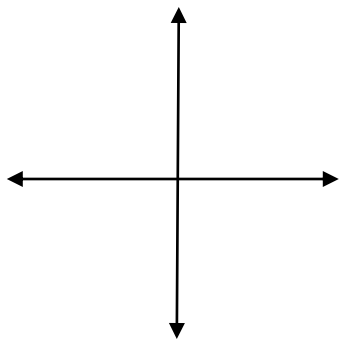
x	-3	-2	-1	0	1
y	13.5	6	1.5	0	1.5

22.

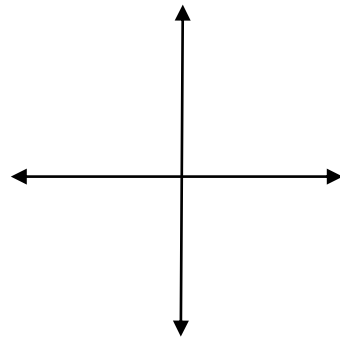
x	-2	-1	0	1	2
y	1	2	4	8	16

23. Give an example of a graph of a parabola which has:

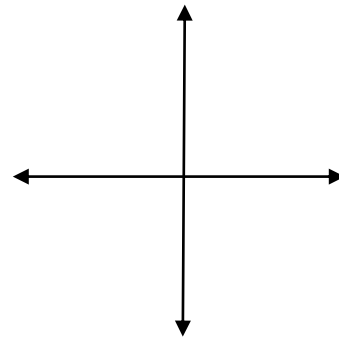
a) No real roots



b) One real root



c) Two real roots



Solve the quadratic using any method.

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

25. $-5x^2 + x - 13 = 0$

26. $9x^2 - 16 = 0$

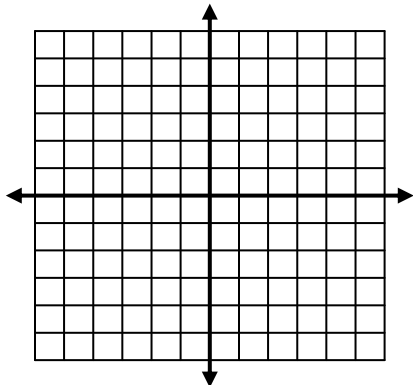
27. The length of Rachel's rectangular garden is 6 yards more than its width. The area of the garden is 91 square yards. What are the dimensions of the garden? (Hint: Use the quadratic formula.)

Chapter 11 Radicals

For problems #1-2, complete the tables, then graph.

1. $y = -2\sqrt{x+1}$

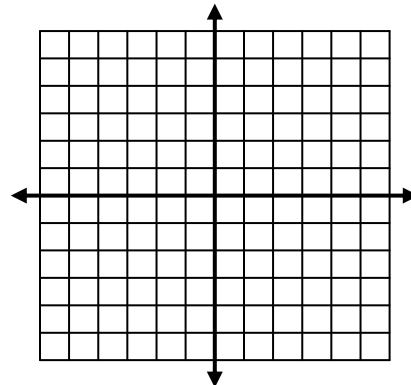
x	-1	0	1	2	3
y					



Compare to $y = \sqrt{x}$:

2. $y = 2\sqrt{x} - 1$

x	0	1	2	3	4
y					



Compare to $y = \sqrt{x}$:

Simplify the following.

3. $\sqrt{200}$

4. $\sqrt{25x^3}$

5. $\sqrt{9a^6}$

6. $\sqrt{64y^4}$

7. $\sqrt{27c^5}$

8. $\sqrt{32r^2s^4t^5}$

9. $\sqrt{40x^4y^5z^3}$

10. $\sqrt{3} \cdot \sqrt{18}$

11. $7\sqrt{30} \cdot 2\sqrt{6}$

12. $\sqrt{\frac{1}{25}}$

13. $\sqrt{\frac{121}{49}}$

14. $\sqrt{\frac{7}{100}}$

Simplify the expression by rationalizing the denominator.

15. $\frac{4}{\sqrt{5}}$

16. $\sqrt{\frac{1}{3}}$

17. $\sqrt{\frac{5}{48}}$

18. $\sqrt{\frac{8}{3n^3}}$

19. $\frac{1}{\sqrt{5}}$

20. $\sqrt{\frac{9}{75}}$

Simplify the following expressions.

21. $3\sqrt{5} + \sqrt{5} - 3\sqrt{5}$

22. $5\sqrt{18} + 2\sqrt{32}$

23. $4\sqrt{6} + \sqrt{30} - 3\sqrt{24}$

24. $\sqrt{7}(4 - \sqrt{7})$

25. $(2 - \sqrt{6})^2$

26. $(2 + \sqrt{5})(1 - 2\sqrt{3})$

Solve the equation. Check for extraneous solutions.

27. $\sqrt{5x} - 4 = 16$

28. $\sqrt{3x+8} = \sqrt{x+4}$

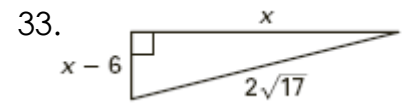
29. $\sqrt{3x+4} = 4$

30. $\sqrt{5x-6} = x$

Find the unknown lengths using the Pythagorean Theorem.

31. $a = 2, b = 8$

32. $b = 7, c = 11$



34. Tell whether the triangle with the given side lengths is a right triangle: 3, 4, 5

Find the distance between the two points.

35. $(-5, 3)$ and $(1, 2)$

36. $(8, -7)$ and $(4, -3)$

Find the midpoint of the line segment with the given endpoints.

37. $(2, 5)$ and $(4, 12)$

38. $(-9, -5)$ and $(7, -14)$

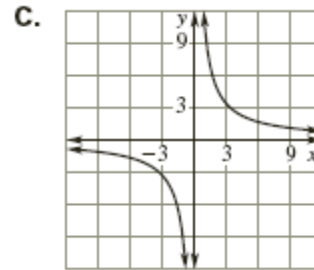
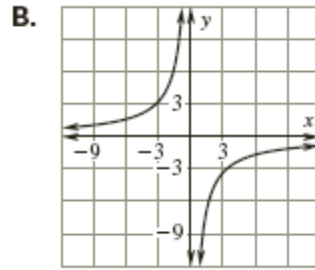
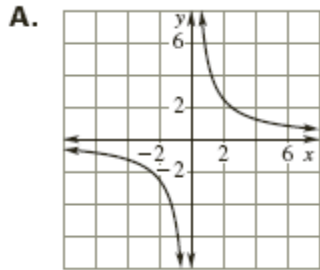
Chapter 12: Rational Functions

Match the inverse variation equation with its graph.

1. $y = \frac{10}{x}$

2. $y = \frac{-10}{x}$

3. $y = \frac{5}{x}$



Tell whether the equation represents direct variation, inverse variation, or neither.

4. $xy = -7$

5. $y = x - 5$

6. $y = \frac{8}{x}$

7. $4x - 3y = 0$

For #3-4, write an equation that relates x and y FIRST, then solve.

8. If y varies inversely as x and $x = 9$ when $y = 4$, find x when $y = 9$.

9. If y varies inversely as x and $x = 10$ when $y = 5$, find y when $x = 5$.

Find the quotient.

10. $(9x^3 - 6x^2 + 18x) \div (3x)$

11. $(-2x^3 + 6x^2 + 4x) \div (-2x)$

12. $(x^2 + 10x + 24) \div (x + 6)$

13. $(22 - 4x + 3x^2) \div (x - 4)$

State the excluded values and simplify the expression.

14. $\frac{9x^3 - 18x^4}{3x^2}$

15. $\frac{15m}{3m + 6m^2}$

16. $\frac{6x^5}{48x^7}$

17. $\frac{m+3}{m^2-9}$

$x \neq$ _____

$m \neq$ _____

$x \neq$ _____

$m \neq$ _____

Find the product, then simplify.

18. $\frac{8}{x^2} \cdot \frac{x^4}{4x}$

19. $\frac{x+3}{2x+8} \cdot \frac{x}{x^2+7x+12}$

20. $\frac{3x-6}{x^2-x-2} \cdot (x^2+6x+5)$

Find the quotient, then simplify.

21. $\frac{5x^2}{7} \div \frac{10x^3}{21}$

22. $\frac{3x+12}{4x-18} \div \frac{2x+8}{x+4}$

23. $\frac{x^2-25}{2x^2+12x+16} \div \frac{x^2+7x+10}{x^2-4}$

24. Find the LCD for: $\frac{3}{20a^2}$ and $\frac{1}{24ab^3}$

25. Find the LCD for: $\frac{11}{56x^3y}$ and $\frac{10}{49ax^2}$

26. What value of x when substituted in $\frac{1}{x+3}$ will make this fraction undefined?

27. What value of x when substituted in $\frac{1}{x-9}$ will make this fraction undefined?

Find the sum or difference.

28. $\frac{t}{3} + \frac{2t}{7}$

29. $\frac{x+2}{3} + \frac{x-6}{5}$

30. $\frac{5}{x-1} + \frac{x}{x-1}$

31. $\frac{8x}{3} + \frac{1}{5x}$

32. $\frac{2}{3x^2} - \frac{8}{5x}$

Solve.

33. $\frac{6}{x+4} = \frac{x}{2}$

34. $\frac{5}{y-2} = \frac{y}{3}$

35. $\frac{8}{x+8} = \frac{x}{x+2}$

36. $\frac{x+4}{4} + \frac{x-2}{3} = \frac{5}{3}$

37. $\frac{x}{6} - \frac{1}{2} = \frac{x+5}{2}$