

Algebra 1 Problem Set 81 Solving Quadratics by Factoring

Solve:

1. $x^2 - 14x - 15 = 0$ 2. $x^2 + 3x - 10 = 0$ 3. $-5x + x^2 + 6 = 0$

4. $x^2 + 5 + 6x = 0$ 5. $3x^2 = 12x$ 6. $42 + x = x^2$

7. $x + x^2 = 42$ 8. $x^2 = 16 + 6x$ 9. $x^2 + 6x = 16$

10. $15x^2 = 10x$ 11. $x^2 + 9 = 6x$ 12. $x^2 = 27 + 6x$

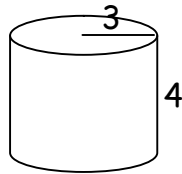
13. $z^2 = 2z + 15$ 14. $20 + p = p^2$ 15. $20t^2 = 8t$

16. $y^2 = 21 + 4y$ 17. $n^2 - n + 20 = 0$ 18. $d^2 = 40 + 3d$

19. Add: $\frac{x}{2x+y} + \frac{2x}{y} + \frac{3y}{8x}$

20. Add: $\frac{a}{a+3b} + b - \frac{a}{b}$

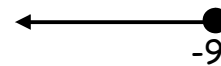
21. Find the volume and the surface area of the right circular cylinder. Dimensions are in inches.



22. The volume of a right circular cylinder that has a radius of 4 inches is 80π cubic inches. Find the height and the surface area of the cylinder.

23. Graph on a number line: $-3 \leq x < 5$, $D = \mathbb{N}$

24. Write both an inequality, and a negated inequality, that corresponds to the following graph.



25. One side of an isosceles right triangle has a measure of 6 inches. Find the perimeter of the triangle.

H and J left Kalamazoo and began the 1200 mile trip to Denver in their diesel motor home traveling at an average speed of 55 miles per hour. B and D left Denver at the same time and headed toward Kalamazoo in their SUV traveling at an average speed of 75 miles per hour.

26. Write an equation for each situation that gives the miles from Denver as a function of time.

27. When they meet, how many miles from Denver are they, and how many hours did they both travel?

28. Solve: $\frac{2x}{3} - \frac{3x+7}{4} = \frac{4x-6}{5}$

Solve each system:

29. $\begin{cases} 3x - y = -17 \\ 3y - 4x = 26 \end{cases}$

30. $\begin{cases} 5x - 2y = 1 \\ -2x + 3y = 15 \end{cases}$

Algebra 1 Problem Set 82 Complex Fractions and Higher Order Roots

Simplify each complex fraction:

1. $\frac{\frac{2}{3}}{\frac{5}{6}}$

2. $\frac{\frac{a}{b}}{\frac{c}{b}}$

3. $\frac{\frac{x^2y^3}{z}}{\frac{xy}{z}}$

4. $\frac{\frac{a+b}{x}}{\frac{a+b}{y^2}}$

5. $\frac{\frac{x+3}{x}}{\frac{y^2}{x-4}}$

6. $\frac{\frac{x-5}{kx}}{\frac{x^2y}{x+5}}$

Evaluate:

7a) $7 \pm \sqrt{4}$

8. $-5 \pm \sqrt{5^2 - 4(4)}$

9. $\frac{1 \pm \sqrt{1 - 4(2)(-6)}}{4}$

b) $9 \pm \sqrt{9}$

10a) $\sqrt[3]{8}$

b) $\sqrt[4]{625}$

c) $\sqrt[5]{243}$

d) $\sqrt[4]{16}$

e) $\sqrt[3]{64}$

11. $\sqrt[3]{125} - \sqrt[4]{81}$

12. $\sqrt[3]{27} + \sqrt[4]{256} - \sqrt[5]{32}$

Solve:

13. $-5(2x - 3) + (-2)^3 = 7 - 3(5 - 4x) - \sqrt{49}$

14. $m^2 + 9m + 20 = 0$

15. $x^2 + 33 + 14x = 0$

16. $3x^2 = 9x$

17. $36 + p^2 = 13p$

18. $8x^2 = 3x$

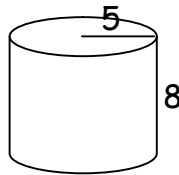
19. $m^2 = 30 + m$

20. $7x^2 - 5x = 0$

21. $n^2 + 18 + 11n = 0$

22. $x^2 + 12x + 27 = 0$

23. Find the volume and the surface area of the right circular cylinder. Dimensions are in centimeters



24. Add: $\frac{4}{x-5} - \frac{3}{x+3} + \frac{1}{x-5}$

25. Solve: $\frac{x+3}{5} - \frac{x-2}{3} = \frac{x+4}{2}$

26. Graph on a number line: $2 < x \leq 8$, $D = \mathbb{Z}$

27. Convert: (a) 100 tablespoons to cups

(b) 250 cups to gallons

28. Solve: $\begin{cases} 5x + 2y = -1 \\ 2x - 3y = 30 \end{cases}$

29. Simplify: $\frac{(12 \times 10^{-5})(6 \times 10^8)}{(3 \times 10^{-9})}$

30. Find the equation of the line that passes through the points (3, 5) and (-4, -9).

Algebra 1 Problem Set 83 Solving Cubic Trinomials with GCF

Solve:

- | | | |
|---------------------------|-----------------------------|------------------------------|
| 1. $2x^3 - 4x^2 - 6x = 0$ | 2. $5x^3 = 45x^2 - 100x$ | 3. $32x - 4x^3 = -28x^2$ |
| 4. $9x^2 + 18x = -x^3$ | 5. $21x^2 + 7x^3 - 28x = 0$ | 6. $50x + 2x^3 = -20x^2$ |
| 7. $48x + 3x^3 = 24x^2$ | 8. $27x = 90 - 9x^2$ | 9. $2x^3 = 84x - 2x^2$ |
| 10. $-5x^3 = 30x - 35x^2$ | 11. $-x^3 + 3x^2 = 54x$ | 12. $24x^2 + 6x^3 + 18x = 0$ |

Simplify each complex fraction.

- | | | | |
|---|----------------------------------|-----------------------------------|---|
| 13. $\frac{\frac{3a}{b^2}}{\frac{a^5}{2b}}$ | 14. $\frac{\frac{a+b}{5c}}{a+b}$ | 15. $\frac{\frac{3p}{d-h}}{6p^3}$ | 16. $\frac{\frac{rs^2t^3}{w-5}}{r^3s^2t}$ |
|---|----------------------------------|-----------------------------------|---|

Evaluate each expression.

- | | | |
|------------------------------------|--|---|
| 17. $3^2 - \sqrt[3]{8} \pm (-2)^4$ | 18. $\sqrt{36} - \sqrt[3]{216} + \sqrt[4]{81} \pm 5$ | 19. $\frac{-6 \pm \sqrt{6^2 - 4 \cdot 1 \cdot 5}}{2 \cdot 1}$ |
|------------------------------------|--|---|

20. Find the volume and surface area of a cylinder with a diameter and height of 10 cm.

21. Find the radius of a cylinder whose volume is 847π cubic inches and height is 7 inches.

Solve:

- | | | |
|---|---|--|
| 22. $\frac{x+5}{3} - \frac{4}{5} = \frac{1}{6}$ | 23. $\frac{3x}{2} + \frac{x-9}{8} = 16$ | 24. $\frac{3x-7}{12} = \frac{x+10}{3}$ |
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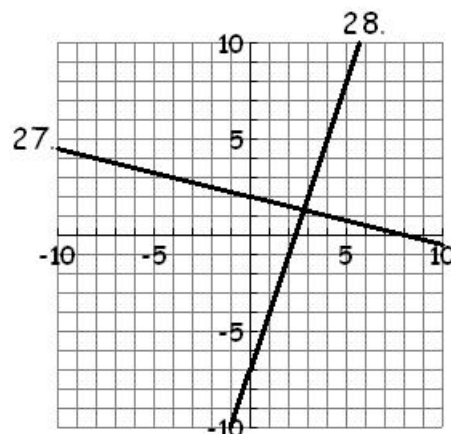
25. Write the equation of the line with a slope of -3 that passes through (-2,7).

26. Timmy is flying his helicopter and spots a cow in the distance. The helicopter is 200 feet above the ground and the cow is 500 feet from a point directly below the helicopter. How far is Timmy's helicopter from the cow?

27, 28. Write the equation of each line.

Evaluate each expression.

- | | |
|------------------------------|-----------------------|
| 29a) -3^{-3} | b) $(-3)^{-2}$ |
| 30a) $x^5y^{-7}x^{-3}y^{10}$ | b) $(x^{-5}y^4)^{-8}$ |



Algebra 1**Problem Set 84****Difference of Squares**

Factor:

1. $x^2 - 16$

2. $4x^2 - 9$

3. $25x^2 - 49$

4. $81x^2 - 144y^2$

5. $3a^2 - 12b^2$

6. $72d^2 - 50$

7. $45k^2 - 20j^2$

8. $27 - 192p^2$

Solve:

9. $3x^2 - 27 = 0$

10. $28x^2 - 7 = 0$

11. $x^2 - 121 = 0$

12. $9x^2 = 64$

13. $x^2 = 9x + 36$

14. $3x^3 - 15x^2 = 18x$

15. $4x^2 + 32x = -64$

16. $10x^2 + 2x^3 = 28x$

17. $6x^3 = 3x^2$

18. $48 = x^2 - 2x$

19. $26x^2 = 2x^3 + 72x$

20. $13x^3 - 13x = 0$

21. Chad has a 12 foot ladder he is using to replace a light bulb. If he needs the ladder to reach 8 feet up the wall, how far from the wall should he place the base of the ladder?

Evaluate each expression.

22.
$$\frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 2(-5)}}{2 \cdot 2}$$

23.
$$\sqrt[4]{16} + \sqrt[3]{125} - \sqrt{64} - 3^2 \pm (-2)^3$$

Solve each system of equations.

24.
$$\begin{cases} 2x - 3y = 11 \\ x + 5y = -1 \end{cases}$$

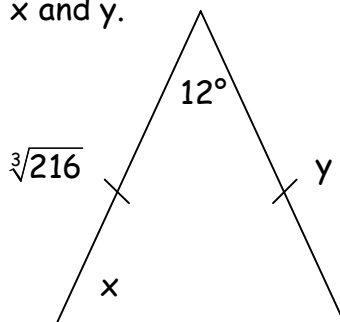
25.
$$\begin{cases} 6x - y = -9 \\ 3x + 5y = -21 \end{cases}$$

26. Simplify.
$$\frac{\frac{3a}{b+c} \cdot \frac{b+c}{a^2b}}{b+c}$$

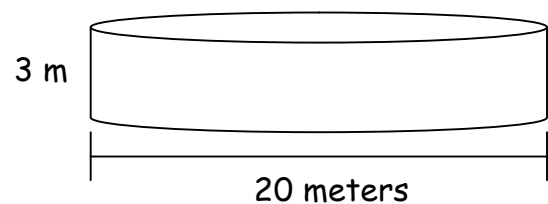
27. Add.
$$\frac{7}{x} - \frac{3}{x+4}$$

28. Convert 4 miles to inches.

29. Find
- x
- and
- y
- .



30. Find the volume and surface area.



Algebra 1 Problem Set 85 Conversions of Area-Volume

- Convert 46 square miles to square feet.
- Convert 3600 square centimeters to square meters.
- Convert 48 square inches to square centimeters.
- Convert 40 square meters to square feet.
- Convert 200 cubic feet to cubic inches.
- Convert 7500 cubic centimeters to cubic feet.
- Convert 500,000 cubic inches to cubic feet.
- Convert 240 cubic meters to cubic centimeters.
- A new golf course has 100 square miles. Convert this measurement to square yards.
- A large farm container for seeds will hold 200 cubic feet. How many cubic meters is this measurement?

Solve:

11. $2d^2 = 18$

12. $75 - 3m^2 = 0$

13. $x^3 - 36x = 0$

14. $2k^3 - 12k^2 - 14k = 0$

15. $3w^3 = -15w^2 - 18w$

16. $g^2 - 12g = -35$

Simplify each complex fraction.

17. $\frac{\frac{4}{x}}{\frac{2x}{5y}}$

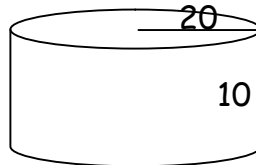
18. $\frac{\frac{m-1}{k}}{\frac{m+2}{k^2}}$

Evaluate:

19. $3 \pm \sqrt{4^2 - 4(1)(3)}$

20. $\sqrt{25} + \sqrt[3]{64} - \sqrt[4]{625}$

21. Find the volume and the surface area of the right circular cylinder. Dimensions are in feet.



22. Add: $\frac{1}{m} - \frac{2}{m^2} + \frac{3}{m+x}$

23. Solve: $1\frac{3}{5}x - 2^{-2} = \frac{1}{10}$

24. Graph on a number line: $x+2 \geq 8$, $D = \{\text{positive integers}\}$

Solve by graphing:

25. $\begin{cases} y = 2x + 3 \\ x = -3 \end{cases}$

Solve using elimination:

26. $\begin{cases} 3x + 5y = 16 \\ 4x - 3y = 2 \end{cases}$

Simplify:

27. $5\sqrt{5}(2\sqrt{10} - 3\sqrt{5})$

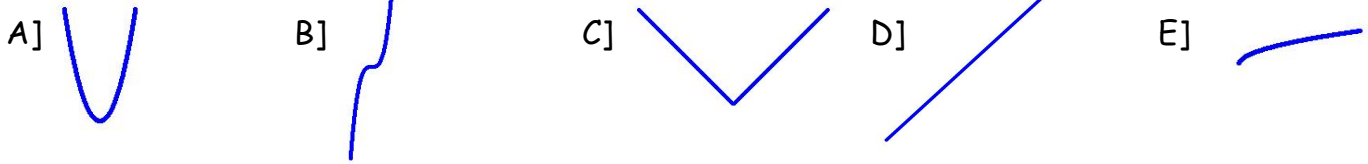
28. $3x(x^2 + 2x - 7) - 4(x^3 + 6x - 5)$

29. If set $A = \{0, 2, 4, 6, 8, 10\}$ and set $B = \{-4, -2, 0, 2, 4\}$;
 Find: a) $A \cup B$ b) $A \cap B$ c) Draw a Venn diagram for $A \cap B$
30. When the PHS soccer team scored, 78% of the crowd stood and cheered. If 792 people did not stand and cheer, how many did stand and cheer?

Algebra 1 Problem Set 86 Recognize Non-Linear Graphs

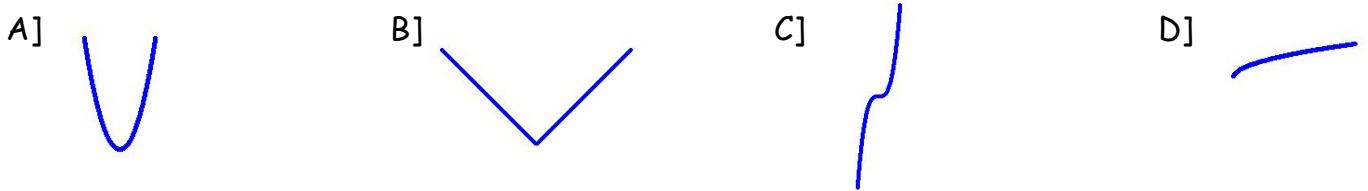
1. Match an equation to a graph.

- a) $y = x^3$ b) $y = |x|$ c) $y = \sqrt{x}$ d) $y = x^2$ e) $y = x$



2. Match an equation to a graph.

- a) $y = |x|$ b) $y = \sqrt{x}$ c) $y = x^2$ d) $y = x^3$



Solve:

3. $24 = -p^2 - 10p$ 4. $-4 + 9m^2 = 0$ 5. $2x^3 + 12x^2 + 16x = 0$

6. $d^2 + 16d + 63 = 0$ 7. $w^2 - 49 = 0$ 8. $12y^2 = 21y$

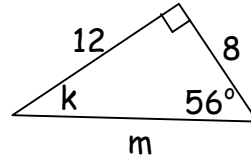
Solve:

9. $\frac{k+4}{2} - \frac{k+6}{3} = 5$ 10. $3\frac{1}{3}x - \frac{1}{6} = \frac{5}{12}$ 11. $m - (m - 4) = m - 6 - 4^0$

Simplify:

12. $\frac{am + a^2m^2}{am}$

13. Find k and m:



14. If the sum of -4 and the opposite of a number is multiplied by -3, the result is 6 less than the product of the number and 2. What is the number?

15. Expanded: $(2m+2p)^2$

16. Expand: $(x+6)(x^2-4x+7)$

17. A right circular cylinder has a radius of 12 meters and a height of 20 meters. Find the volume of the cylinder.

18. Convert 44 square miles to square inches.

19. Convert 1866 square centimeters to square feet.

20. Convert 21 cubic miles to cubic feet.

21. Convert 520 cubic millimeters to cubic meters.

22. Simplify: $\frac{(30 \times 10^{-8})(8 \times 10^6)}{(4 \times 10^5)}$

23. Evaluate $\frac{\sqrt[3]{x-w}}{2}$ if $x = -100$ and $w = -127$

24. If $f(x) = x^2 - 2x + 3$, find $f(6)$ and $f(-3)$.

25. The scores on the test were as follows:

85, 93, 68, 79, 85, 87, 95, 75, 82, 91, 65, 73, 81, 98, 46

Find the range, median, mode and mean of the set of scores.

26. What fraction of $7\frac{2}{5}$ is $49\frac{1}{3}$?

27. Simplify: $\frac{\frac{x+y}{m^3}}{\frac{1}{m^4}}$

Evaluate:

28. $3 \pm \sqrt{169}$

29. Factor: $30a^2b^3 - 15ab^4 + 45a^3b^2$

30. Simplify: $\frac{1}{(-4)^{-3}} - \sqrt[3]{64}$

Algebra I Problem Set 87 Rational Expressions

Simplify:

1. $\frac{x^2 - 2x - 15}{x^2 + 3x} \cdot \frac{x^2 + 2x}{x^2 - 4}$

2. $\frac{x^2 - 16}{x^2 + 6x + 8} \cdot \frac{x^2 - 4x - 12}{x^2 - 10x + 24}$

3. $\frac{x^3 - 3x^2 - 10x}{x^2 - 4} \div \frac{x^2 - 5x}{x^2 - 9x + 14}$

4. $\frac{3x^2 - 30x + 63}{x^2 - 7x} \div \frac{3x^2 - 27}{x^2 + 6x + 9}$

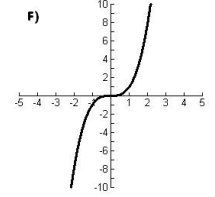
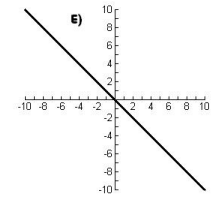
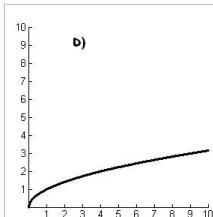
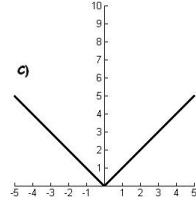
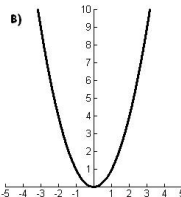
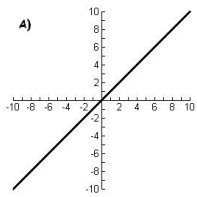
5. $\frac{\frac{x^2 y^3}{a+b}}{\frac{x^3 y}{a+b}}$

6. $\frac{2x^2 y + 10xy}{x + 5}$

7. $\sqrt[3]{-27} - \sqrt[4]{16} \pm \sqrt{49}$

8. $\frac{3 \pm \sqrt{3^2 - 4(1)(-18)}}{2}$

Match each graph with an equation:



9a) $y = x^2$

b) $y = -x$

c) $y = |x|$

10a) $y = \sqrt{x}$

b) $y = x$

c) $y = x^3$

Solve each equation.

11. $3x^2 - 75 = 0$

12. $4x^2 + 8x = 60$

13. $x^2 + x = 30$

14. $x^3 - 8x^2 + 7x = 0$

15. $3x^2 + 21x = 0$

16. $2x^3 = 18x$

17. $x^2 + 11x + 24 = 0$

18. $\frac{2x+3}{4} - \frac{x}{6} = \frac{29}{12}$

19. The room measured 12 feet wide by 15 feet long. How many square yards of carpet are required to completely cover the floor?

20. The container measured 2 inches wide by 4 inches long by 8 inches tall and was full of milk. How many cubic centimeters of milk is in the container?

Solve each system of equations.

$$21. \begin{cases} 5x + 4y = 18 \\ 3x - y = 21 \end{cases}$$

$$22. \begin{cases} 3x - 5y = 14 \\ 7x + 3y = -26 \end{cases}$$

Elsie was a saver. She opened a savings account and put in \$50 every week. Jane was a spender. She started with \$6000 in an account and withdrew \$300 every month.

23. Write an equation for each girl that represents their account balance each week.

24. Solve the system of equations from Problem # 23. What does the value of each variable represent?

25. Find the complement and the supplement of a 67° angle.

26. The base of a prism is a right triangle with sides of lengths 5 inches and 12 inches. The height of the prism is 10 inches. Find the volume and the surface area of the prism.

27. The radius of the base of a circular cylinder is 4 inches. The cylinder is 9 inches tall. Find the volume and the surface area of the cylinder.

28. A line passes through the points $(-7, 3)$ and $(-3, -5)$. Find the equation of the line, and find the x intercept and the y intercept of the line.

Simplify:

29a) $\sqrt{3}\sqrt{12}$

b) $3\sqrt{6} \cdot 4\sqrt{3}$

c) $\frac{\sqrt{12}}{\sqrt{3}}$

d) $\frac{12\sqrt{15}}{4\sqrt{3}}$

30a) -2^4

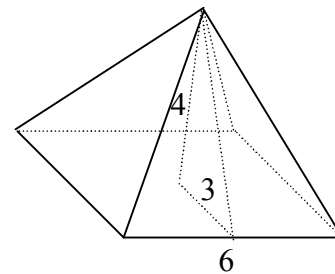
b) $(-3)^3$

c) -5^{-2}

d) $(-4)^{-3}$

Algebra I Problem Set 88 Spheres, Cones, and Pyramids

- Find the volume and the surface area of a sphere that has a radius of 2 inches.
- Find the volume and the surface area of a sphere that has a radius of 5 centimeters.
- Find the volume and the surface area of a circular cylinder that has a radius of 6 inches and a height of 4 inches.
- Find the volume and the surface area of a circular cone that has a radius of 3 centimeters and a height of 4 centimeters.
- Find the volume and the surface area of a circular cone that has a radius of 5 inches and a height of 12 inches.
- Find the volume and the surface area of a prism whose base is an isosceles right triangle with sides of length 8 inches and that is 4 inches tall.
- Find the volume and the surface area of the square pyramid shown at the right. Dimensions are in feet.

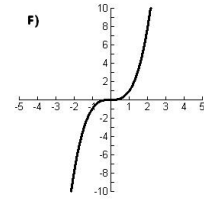
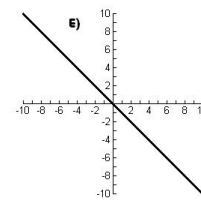
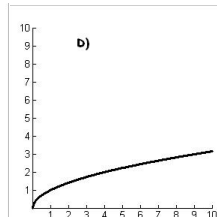
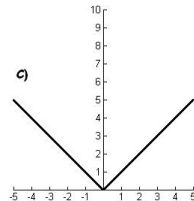
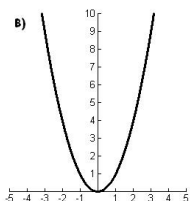
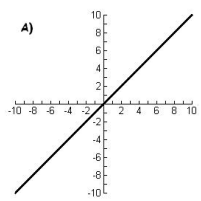


Simplify:

8. $\frac{x^3 - 64x}{4x - 20} \cdot \frac{x^2 - 3x - 10}{x^3 + 10x^2 + 16x}$

9. $\frac{x^2 + 6x}{3x^2 - 147} \div \frac{x^2 + 8x + 12}{6x^2 - 30x - 84}$

Match each graph with an equation:



10a) $y = x^3$

b) $y = \sqrt{x}$

c) $y = x^2$

11a) $y = x$

b) $y = -x$

c) $y = |x|$

- A triangle has a base of 100 inches and a height of 60 inches. In square feet, what is the area of the triangle?
- One liter is 1000 cubic centimeters. How many cubic inches are in one liter?

Solve each equation.

14. $7x^2 + 63x = 0$

15. $3x^2 = 9x + 120$

16. $2x^3 + 60x = 26x^2$

17. $4x^3 = 100x$

18. $\frac{x-3}{4} - \frac{2x+1}{8} = \frac{4x+3}{2}$

19. $7 - 3(x - 5) + \sqrt[3]{-27} = 4(-3x + 1) - \sqrt[4]{81}$

20. Solve: $\begin{cases} 3x - 5y = -10 \\ -2x + 3y = 7 \end{cases}$

21. Solve by graphing: $\begin{cases} 2x - y = 2 \\ 3x - 4y + 12 = 0 \end{cases}$

Simplify

22. $\frac{\frac{3x+2y}{x^3y^2}}{\frac{3x+2y}{3xy^3}}$

23. $(-3)^2 - 2^3 \pm \sqrt{25}$

24. The recipe called for $2\frac{1}{2}$ cups of milk. Janet was baking for a large group and needed to multiply the recipe by 12. How many gallons of milk should she add?

25. Write the equation of the line that has a slope of $\frac{2}{3}$ and that passes through $(-3, 7)$.

26. Write a conjunction that corresponds to 

27. Find $f(-3)$ and $f(4)$ if $f(x) = x^2 - 3x + 2$

28. Add: $\frac{3}{x-2y} + \frac{2x+4}{x(x-2y)} - \frac{5-x^2}{x^2(x-2y)}$

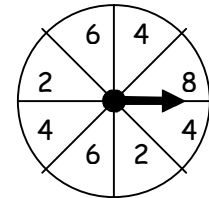
29. Add like terms: $\frac{3x^2y}{x^{-1}y^{-1}} - \frac{4x^2}{y^{-3}} + \frac{7y^4}{x^{-2}y} - \frac{5x}{y^{-2}x^{-2}}$

30. Distribute. Write the answer with all exponents positive. $\frac{4x^{-3}y^2}{xy^{-3}} \left(\frac{xy^{-1}}{2^3x^{-3}} - \frac{2x^2y^3}{y^5x^{-3}} \right)$

Algebra 1 Problem Set 89 Probability

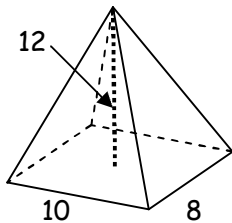
1. A fair coin is tossed. What is the probability that it will land on tails?
2. A fair die is rolled five times. What is the probability that it will land on three on the sixth roll?
3. Two fair dice are rolled. What is the probability that their sum is a number greater than eight?
4. Two fair dice are rolled twice. What is the probability that their sum is a nine followed by a three?
5. A jar contains 24 red, 10 blue, and 16 white jelly beans. What is the probability of drawing a red followed by a white jelly bean?
 - a) with replacement
 - b) without replacement

6. The spinner is spun three times. What is the probability of landing on a four each time?

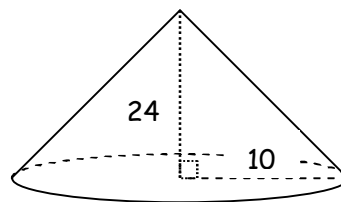


7. Two cards are drawn from a deck of playing cards. What is the probability of drawing a ten following by a face card?
 - a) with replacement
 - b) without replacement
8. Find the volume and surface area of a sphere with a diameter of 12 inches.

9. Find the volume for the pyramid. Dimensions are in meters.



10. Find the surface area for the cone. Dimensions are in yards.



Simplify the following:

11. $\frac{x^2 + 3x - 10}{x^2 - 5x + 6} \cdot \frac{x^2 - 9}{x^2 + 6x + 5}$

12. $\frac{x^2 - 6x - 16}{x^2 - x - 56} \div \frac{x^2 - 7x + 12}{x^2 + 4x - 21}$

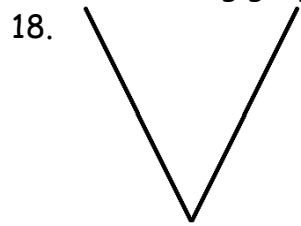
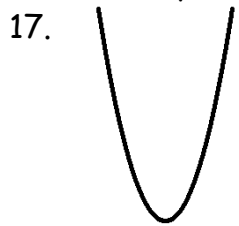
13. $\frac{3x^2 + 12x}{x^2 + 3x - 4} \cdot \frac{x^2 - 2x + 1}{8x - 8}$

14. $\frac{x^2 + 8x + 12}{x^2 - 2x - 8} \div \frac{x^2 - 36}{x^2 - 8x + 16}$

15.
$$\frac{12x^3y^4 - 9x^4y^3}{3x^3y^3}$$

16.
$$\sqrt[4]{16} - \sqrt{16} \pm 16$$

Write an equation to match the following graphs.



21. John needs to paint a styrofoam sphere for his science project. If the radius of the sphere is 3 inches long, how many square centimeters does he need to paint?

Solve.

22. $3x^2 - 48 = 0$

23. $x^3 - 5x^2 = 14x$

24. $x^2 + 14x + 10 = 2x - 10$

25.
$$\frac{4}{x+3} = \frac{1}{x+1}$$

26.
$$\frac{1}{2} - \frac{4x-5}{6} = 6$$

27.
$$\frac{1}{2}x - \frac{2}{3} = 1\frac{1}{4}$$

28. Find the equation of the line that passes through the points $(-3, -1)$ and $(0, -7)$.

29. A flagpole that is 30 feet tall casts a shadow that is 5 feet long. How far is it from the top of the flagpole to the tip of its shadow?

30. Graph $-2 \not\leq x < 1$, $D = \mathbb{R}$ on the number line.

