

WORKSHEET ANSWERS

Expressions

Variables

- 1) Name a variable for: a) the age of your school; b) the weight of the food you eat in one day;
c) the time you sleep each day; d) the speed of a car

a) a b) w c) t d) s

(Any variable is okay)

Expressions

- 2) Rewrite the following in an algebraic format:

a) $5a \div b$ b) $3 \times c \times d$ c) $(4x + 3) \div 7b$ d) $7 \times c + 8 \div d$

$$\frac{5a}{b}$$

$$3cd$$

$$\frac{4x + 3}{7b}$$

$$7c + \frac{8}{d}$$

e) $8x + 3 \div a$

f) $(4f - 3) \div (3 \times n)$

g) $5 \times 3g - 7 \div (4n + 2)$

$$8x + \frac{3}{a}$$

$$\frac{4f - 3}{3n}$$

$$15g - \frac{7}{4n + 2}$$

- 3) An expression that uses a variable is called a(n) Algebraic or Variable expression.

- 4) Write expressions for the following word phrases:

a) thirty-five decreased by a number, n

$$35 - n$$

b) five times a weight, w

$$5w$$

c) the quotient of 15 and a number, x

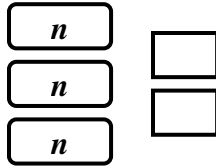
$$\frac{15}{x}$$

d) a number decreased by 5

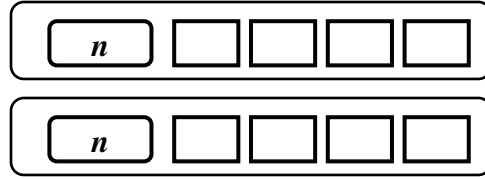
$$n - 5$$

5) With $n = \boxed{n}$, and $1 = \boxed{}$ draw the following expressions:

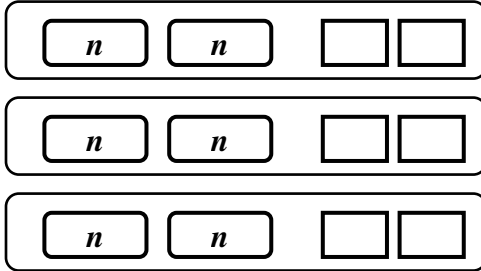
a) $3n + 2$



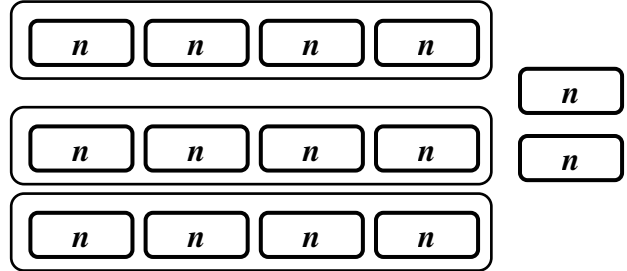
b) $2(n + 4)$



c) $3(2n + 2)$



d) $3(4n) + 2n$



6) Using the Order-of-Operations evaluate the following expressions:

a) $5 + 6 \div 7 \times 8$

a) **11.857**

b) $3 \div 3 + 4 \div 4$

b) **2**

c) $2(11 + 2c)$, with $c = 3$

c) **34**

d) $(3n)(4k)$, with $n = 2$, $k = 5$

d) **120**

e) $3w + 4w - w$, with $w = 3$

e) **18**

f) $\frac{(3n + 1)}{2(2 - n)}$, with $n = 1$

f) **2**

Patterns

7) In words describe the patterns below:

a) $3, 5, 8, 12, 17, 23, \dots$

The second number adds 2 to the first. The third number adds 3 to the second. The fourth adds 4 to the third, and so on.

b) $7m, 14m, 21m, 28m, \dots$

The first expression is one times $7m$. The second expression is 2 times $7m$. The third is 3 times $7m$, and so on.

c) $9c + 1, 7c + 1, 5c + 1, \dots$

The second expression is $2c$ minus the first. The third expression is $2c$ minus the second and so on.

Real Numbers

Negative

1) What do you call a number that is less than zero? Why?

A negative number. Because it represents a loss and is opposite of a positive value.

2) Describe absolute value.

Absolute value is the distance from zero on the number line.

3) Write integers for the following:

- | | |
|--|---------------|
| a) 40 degrees Celsius below zero | a) -40 |
| b) You are 7 points down in a game | b) -7 |
| c) A coral reef is 10 meters below sea level | c) -10 |
| d) You lost \$10 | d) -10 |

4) Put less than (<), greater than (>), or equal signs (=) between the following:

- | | | |
|---------------|---------------|------------------|
| a) $ -4 = 4$ | b) $-3 < -2$ | c) $-5 > -6$ |
| d) $8 > -9$ | e) $8 < -9 $ | f) $ -4 < -5 $ |

Number Line

5) In one sentence describe adding integers with the same signs. (examples $4 + 4$, $-4 + -4$)

Add their absolute value and keep the sign.

6) In one sentence describe adding integers with different signs. Remember AV.

Subtract the largest absolute value from the smallest absolute value and keep the sign of the largest absolute value.

7) How is an English double negative like subtracting a negative number?

Double negatives cancel each other and subtracting a negative is like adding a positive.

8) What are the 3 words for remembering sign for multiplication and division?

Count The Amount!

9) What does an even number of negative signs in multiplication give for an answer?

A positive answer.

10) What does an odd number of negative signs in division give for an answer?

A negative answer.

Evaluations

11) Evaluate the following expressions:

- | | |
|---------------------------|-------------------------------|
| a) $5 + (-3) = 2$ | b) $-5 + (-2) - 3 = -10$ |
| c) $12 - (-5) = 17$ | d) $-6 + (-3) - (-3) = -6$ |
| e) $(-4)(-3) = 12$ | f) $(-4)(3)(-3) = 36$ |
| g) $15 \div (-5) = -3$ | h) $(-20) \div (-4) = 4$ |
| i) $ -6 + (-3) - 5 = 14$ | j) $- 3 - 6 - 7 - (-2) = -8$ |

12) Evaluate the following expressions with the given values of n :

$5n + 3 - (-4)$	$n = 5$ 32	$n = -3$ -8	$n = -\frac{1}{2}$ $4\frac{1}{2}$
$\frac{3}{4}n - 5$	$-1\frac{1}{4}$	$-7\frac{1}{4}$	$-5\frac{3}{8}$
$n^2 - 3n + 2$	12	20	$3\frac{3}{4}$
$\frac{3n - 3}{2n}$	1.2	2	$4\frac{1}{2}$

Equations, Formulas & Proportions

Equations

1) Describe the difference between an equation and an expression. Name at least 2 things.

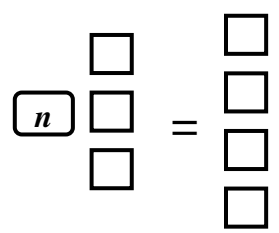
An equation has an equal sign while an expression does not. An equation is solved while an expression is evaluated.

2) Why must an equation balance? How do you make sure it balances?

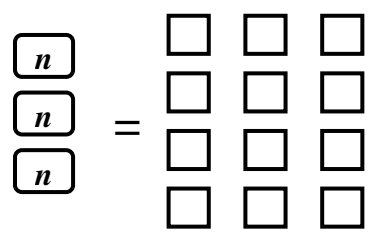
An equation must balance to maintain its equality. You make sure an equation balances by performing the same operation to BOTH sides of the equation.

3) Write equations for the following, with $\boxed{n} = n$, $\square = 1$, and $\text{shaded square} = -1$:

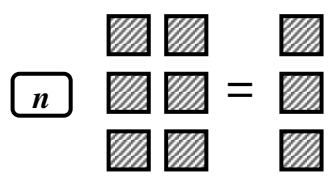
a) $n + 3 = 4$



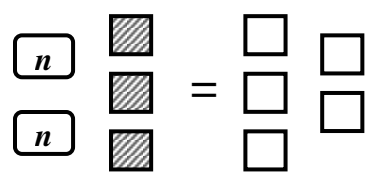
b) $3n = 12$



c) $n - 6 = -3$



d) $2n - 3 = 5$



4) Write equations from the following:

a) Seven more than a number, n , is 21.

a) $n + 7 = 21$

b) One-third of a number is ten.

b) $\frac{n}{3} = 10$

c) Twice the distance is 14 meters.

c) $2d = 14$

d) Cost equals the price minus the discount.

d) $C = p - d$

Formulas

5) If the area of a rectangle is 20 square meters and the length of the shorter side is 4 meters, what is the length of the longer side?

5 meters

6) If the perimeter of a rectangle is 20 meters and the shorter side is 4 meters, what is the length of the longer side?

6 meters

7) Why can you treat formulas like equations? Give an example.

A formula is an equation that expresses a relationship between two or more quantities.

Solving the area like in problem 9, $A = lw$ or $20 = 4w$, solve for w .

PROPORTION

8) Solve proportion, $\frac{2}{x} = \frac{7}{14}$. Show each step of the process you use.

a) **Cross multiply**

$2(14) = 7x$

b) **Divide both sides by 7,**

$\frac{2(14)}{7} = \frac{7x}{7}$

c) **Solve for x ,** $x = 4$

9) A sports car can drive 1,300 kilometers in one day. How many days for the sports car to drive 4,290 kilometers? Set up as a proportion equation and solve.

a) **1,300 is to 1 as 4,290 is to what, x ?**

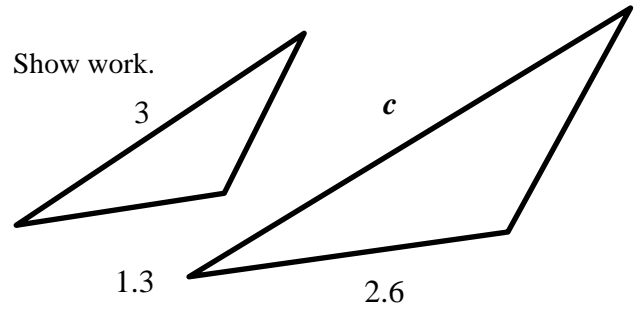
b) $\frac{1,300}{1} = \frac{4,290}{x}$

c) **$x = 3.3$ days**

10) To the right are similar triangles. What is side c ? Show work.

a) $\frac{3}{1.3} = \frac{c}{2.6}$

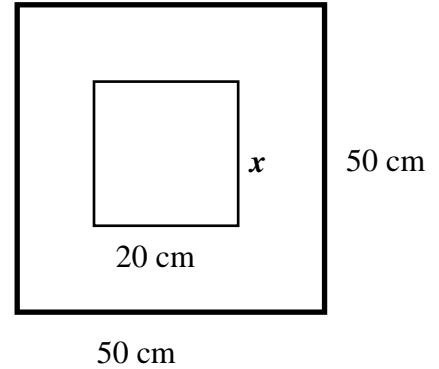
b) $c = 6$



12) For the similar squares below, find x .

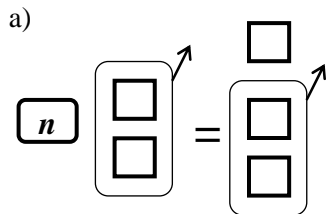
a) $\frac{50}{50} = \frac{x}{20}$

b) $x = 20$

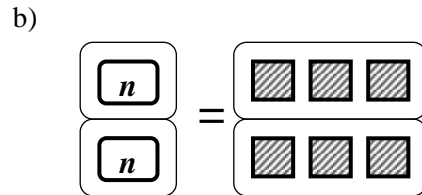


Solving Linear Equations

1) Describe the situation you think is being represented in each diagram.



Subtracting 2 from both sides of the equation.



Dividing both sides by 2.

2) Why should you always check your answer when solving an equation?

To be sure you did not make any mistakes. To prove you solved correctly – you have the right answer.

3) Solve the following equations for the variable:

a) $n + 2 = -2$; $n = -4$

c) $x - 3 = -5$; $x = -2$

e) $2n = 14$; $n = 7$

g) $\frac{3}{8}x = -3$; $x = -8$

b) $y - 3 = 4$; $y = 7$

d) $k - (-3) = -4$; $k = -7$

f) $\frac{1}{2}y = 5$; $y = 10$

h) $6 = -\frac{2}{3}i$; $i = -9$

i) $\frac{5}{k} = 10$; $k = \frac{1}{2}$

j) $\frac{i}{3} = 9$; $i = 27$

k) $\frac{2}{5n} = \frac{2}{4}$; $n = \frac{4}{5}$

l) $3n = \frac{1}{3}$; $n = \frac{1}{6}$

- 4) In the two-step equation, $2n + 3 = 9$, which inverse operation should you perform first? Why? Is this always true?

Subtract 3 first. It makes it easier to solve. In this type of equation it is generally easier to solve by doing inverse operation of the addition or subtraction first.

- 5) Sara charges \$5 per hour for babysitting. She was paid \$24 one evening for 4 hours. How much was she tipped for the evening?

Sara was tipped \$4.

- 6) Solve the following equations for the variable:

a) $4x - 6 = 5$; $x = \frac{11}{4}$

b) $-3n + 5 = -10$; $n = 1\frac{2}{3}$

c) $-k + 3 = 9$; $k = -6$

d) $7 = -\frac{2}{3}i + 4$; $i = -4.5$

e) $\frac{n}{4} - 5 = 11$; $n = 64$

f) $\frac{4}{k} - 3 = -13$; $k = -\frac{2}{5}$

g) $-2x + 4 = 0$; $x = 2$

h) $\frac{1}{2}n - 3 = -3$; $n = 0$

- 7) The Fahrenheit and Celsius temperature scales are related by the formula, $F = \frac{9}{5}C + 32$. A normal body temperature is 98 degrees Fahrenheit (F). What is this in Celsius (C)?

$$C = 36\frac{2}{3}$$

- 8) Solve the following equations for the variable:

a) $-5n + 2n = -9$; $n = 3$

b) $4x - 6 = 5x$; $x = -6$

c) $-7 + 4m = 3m + 4$; $m = 11$

d) $5r - 4 = 10r + 3$; $r = -1\frac{2}{5}$

e) $\frac{1}{2}(4x + 2) = 3(x - 3)$; $x = 10$

f) $2n + 4n - 3 = 5 - 2n + 3n$; $n = 1\frac{3}{5}$

- 9) Sara is one mile behind Anne running at 15 mph (miles per hour) who is running at 10 mph. Write the equations describing this and solve for how long it takes Sara to catch up to Anne.

Sara: $x = 15t - 1$; Anne: $x = 10t$; When their positions (x) are the same the equations are equal -- $15t - 1 = 10t$. Solving for t -- $t = \frac{1}{5}$ hours or 12 minutes.

10) Solve the following equations for the variable:

a) $|x - 5| = 7$; $x = 12$ or $x = -2$

b) $|6 - n| = 12$; $n = -6$ or $n = 18$

c) $|2m + 6| = 3$; $m = -1\frac{1}{2}$ or $m = -4.5$

d) $\frac{1}{2}|4y + 8| = 2$; $y = -1$ or $y = -3$

11) Solve the equation, $2x - 3y = -5$, for y ? $y = \frac{2x + 5}{3}$

12) The perimeter (P) of a rectangle is 424 centimeters. If the height (H) of the rectangle is 100 centimeters what is the width (W) of the rectangle?

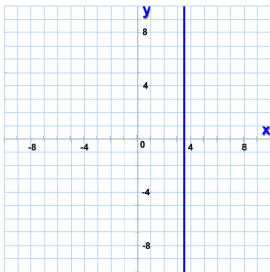
The perimeter of a rectangle is give by $P = 2H + 2W$. $W = 112$

Graphing Linear Equations

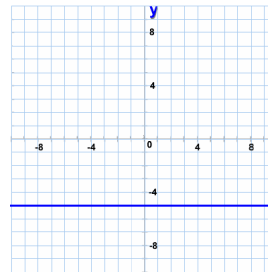
Graphing

1) Graph:

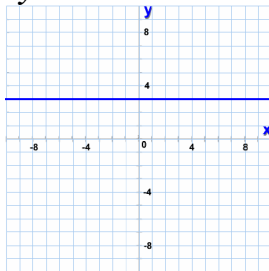
a) $x = 3.5$



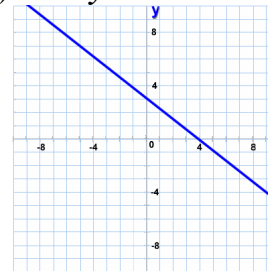
b) $y = -5$



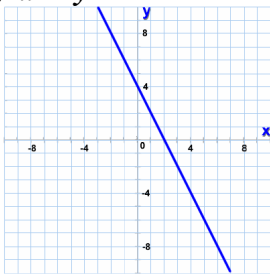
c) $4y = 12$



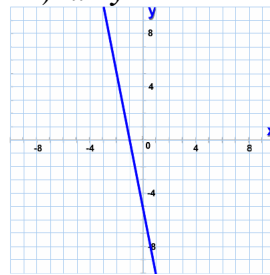
d) $3x + 4y = 12$



e) $-x - 2y = -4$



f) $4x - y = -4$



- 2) How many points are needed to determine a line? **2 points**
- 3) What is the y-axis intercept of the line $x = -4$? **There is none.**

Explain? **This line is parallel to the y-axis ($x = 0$ line).**

- 4) For what type of lines is the quick-graph method using intercepts not applicable?

One variable lines (i.e. $x = 1$ or $y = 1$) and lines of the slope-intercept form $y = mx + b$.

Slope

- 5) Calculate the slope of the line connecting the following two points:

a) $(0, 4)$ and $(6, 0)$: $m = -\frac{2}{3}$

b) $(2, 3)$ and $(-6, -2)$: $m = \frac{5}{8}$

c) $(-2, -2)$ and $(-4, -4)$: $m = 1$

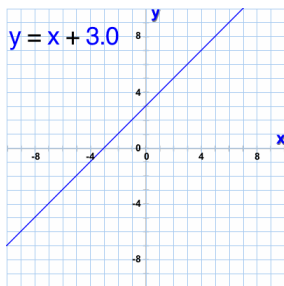
d) $(-4, 4)$ and $(-3, -4)$: $m = -8$

- 6) What type of line has a slope of zero? Give an example? **A horizontal line, for example $y = 3$.**

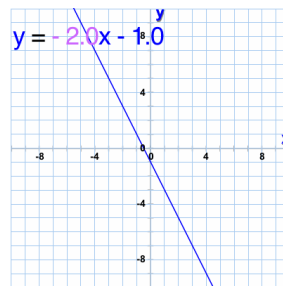
- 7) What type of line has a slope that is undefined? Give an example? **A vertical line, for example $x = 3$.**

- 8) Graph the line with the given slope (m) and intercept (b):

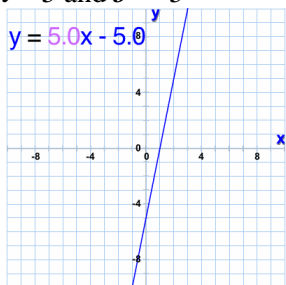
a) $m = 1$ and $b = 3$



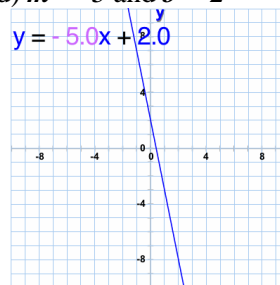
b) $m = -2$ and $b = -1$



c) $m = 5$ and $b = -5$



d) $m = -5$ and $b = 2$



- 9) What point does the line, $y = -3x + 2$, intercept the x-axis? $x = \frac{2}{3}$
- 10) If a ramp rises 1 foot for every 4 feet it runs, how many feet will it run before it rises 5 feet?
20 feet

Writing Linear Equations

From Graphs

- Write a linear equation whose slope is 5 and whose y-intercept is -5? $y = 5x - 5$
- In Spain it costs \$1 (in Euros) to connect a long distance call and it also costs \$0.40 per minute to talk.
 - Write a linear equation to model the charges? $C = \frac{2}{5}t + 1$ or $y = \frac{2}{5}x + 1$ ($\frac{2}{5} = 0.40$)
 - How many minutes talking before the total cost is \$5? **10 minutes**
- Write linear equations in slope-intercept from the lines graphed:

a) $y = -\frac{1}{3}x$	b) $y = -4x + 1$	c) $y = \frac{1}{3}x - 2$	d) $y = \frac{1}{5}x + 4$
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Point-Slope

- The population of a town was 50,000 in the year 2000 and rising at a rate of 5,000 per year.
 - Write a linear equation in slope-intercept form describing the population growth? $y = P = 5000t - 9950000$ or $y = 5000x - 9950000$
 - What is the estimated population of the town in the year 2100? **550,000**
- Write linear equations in slope-intercept form given a slope (m) and a point:

a) $y = 5x + 3$	b) $y = -\frac{2}{5}x - 4$
c) $y = -4x + 5$	d) $y = -5x - 4$
e) $y = -\frac{2}{3}x - 1$	f) $y = -\frac{1}{2}x - 4$

6) Describe the process of finding a slope-intercept linear equation given a slope and point on the line? **Check for appropriate written answer – substitute point into equation and solve for b.**

Two-Point

- Write a linear equation in slope-intercept given the following two points:

a. $y = x + 1$	b. $y = -2x + 7$	c. $y = -1$	d. $x = -4$ --undefined slope
e. $y = 4x - 11$	f. $y = -\frac{1}{4}x + 6$		

8) It costs \$2 for 5 candy bars and it costs \$15 for 50 candy bars.

- a. Unit rate: $\frac{15-2}{50-5} = \frac{13}{45}$ b. $C = \frac{13}{45}n + \frac{25}{45}$ c. **344 rounded to whole number.**

System of Linear Equations

Solve by Graphing

1) A total of \$14,000 is invested in two funds paying 4% and 5% annual interest. The combined interest is \$620.

- a. Write a system of equations to model this problem?

Two funds A is the amount in the 4% fund, B is the amount in the 5% fund.

$$620 = 0.04A + 0.05B$$

$$\text{-- } \$1000 = \text{interest in A} + \text{interest in B}$$

$$15000 = A + B$$

$$\text{-- total invested in A and B}$$

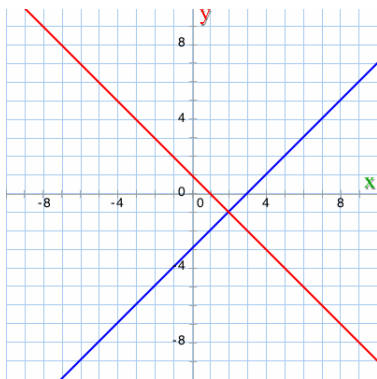
- b. Graph this system and use the graph to estimate how much was invested in each fund?

$$\mathbf{A = \$8000 \text{ and } B = 6000}$$

2) Graph the following linear systems and give their solution:

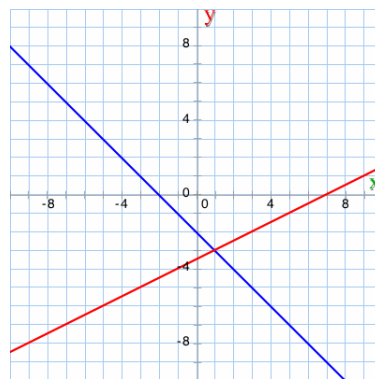
a) $x - y = 3$ Answer: (2, -1)

$$x + y = 1$$



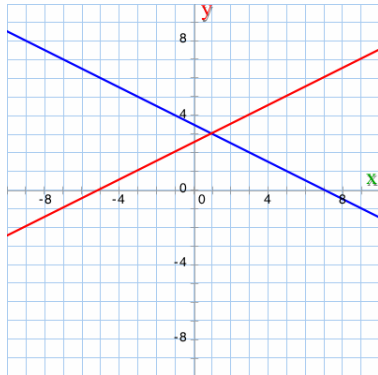
b) $x + y = -2$ Answer: (1, -3)

$$-x + 2y = -7$$



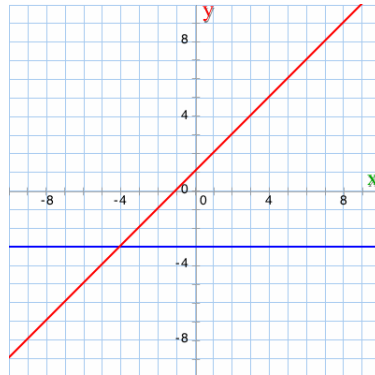
c) $x + 2y = 7$ Answer: (1, 3)

$-x + 2y = 5$



d) $2y = -6$ Answer: (-4, -3)

$-x + y = 1$



3) What is the solution for a linear system if the two lines are parallel? Explain?

Parallel lines never intersect, therefore there is no solution.

Solve by Substitution

4) Solve the following systems of linear equation by using the substitution method:

a) $x - 2y = 10$
 $-4x - 3y = 37$

Answer: **(-4, -7)**

c) $x + 3y = 4$
 $-3x - 9y = -12$

Answer: **All points on line**

b) $-4x + y = 10$
 $3x + 3y = 15$

Answer: **(3, 2)**

d) $-3x - 3y = 18$
 $-x + 3y = 2$

Answer: **(-5, -1)**

5) What does it mean when solving linear system by substitution if you get a result of a constant equals the same constant ($1 = 1$, $0 = 0$, etc.)? What is the answer of such a system?

The lines in the system are the same. Every point on the line is a solution

Solve by Linear Combination

6) Solve the following systems of linear equation by using linear combination:

a) $-3x + 4y = 26$
 $4x + 2y = -20$

Answer: **(-6, 2)**

c) $x + 2y = 7$
 $-x + 2y = 5$

Answer: **No solution – parallel lines**

b) $3x - 3y = -36$
 $2x + 5y = 32$

Answer: **(-4, 8)**

d) $-2x + 4y = -18$
 $-4x + 5y = 42$

Answer: **(-3, 6)**

7) In your own word describe which solution method is better in what situation. Include examples explaining your reasoning.

Use the graphing method when the system is easily graphed (or is graphed) for an approximate solution – such as reading a graph. For system where one variable had a coefficient of 1 or -1 it is often easier to use the substitution method – solve for the 1 coefficient variable and substitute into the other equation. Example is $x - y = 0$ and $-3x - 2y = 3$. Otherwise linear combination is easiest.

Exponents and Powers

1) Simplify the following, if possible:

a) $\frac{x^3}{x^9} = x^{-6}$

b) $(x^5)^5 = x^{25}$

c) $\frac{n^7}{n^2} = n^5$

d) $k^3 \cdot k^3 = k^6$

e) $(y^8)^7 = y^{56}$

f) $|(-3)^2|^3 = 729$

g) $2y^2 \cdot (2y)^3 = 16y^5$

h) $(-2t)^2 \cdot (-t)^3 = -4t^5$

i) $x^{-2} \cdot x^2 \cdot y^4 \cdot y^{-3} = y$ j) $\left(\frac{2xy^{-2}y^4}{3xy}\right)^{-1} \cdot \left(\frac{xy}{2x^{-2}y}\right) = \frac{3x^2y^2y^2x^2}{2xy^42y} = \frac{3x^4y^4}{4xy^5}$

- 2) Greg inherits \$1000 at the age 10. He is considering investing it in a certificate of deposit for 10 years at an interest rate of 8% annually. How much would his investment be worth in 5 and 10 years? **5 years = \$1469 and 10 years = \$2159**
- 3) A business earned \$150,000 in 1980. Their earnings declined 2% for the next 10 years. Write a mathematical model for their earnings decline, with 1980 represented by $t = 0$, and calculate their earnings in 1990? **$E = 150000(1 - 0.02)^t$ at $t = 10$ (1990) $E = \$122,560$**
- 4) Convert the following numbers to scientific notation:

a) $150000000000 = 1.5 \times 10^{11}$

b) $0.000000000236 = 2.36 \times 10^{-10}$

c) $-0.00235 = -2.35 \times 10^3$

e) $145 \times 10^{56} = 1.45 \times 10^{58}$

- 5) 5) The United States population is approximately 280 million and the world population is approximately 6.3 billion. Write a ratio of the United States population to the world's population; express the ratio in scientific notation and as a percentage?

$$\frac{280,000,000}{6,300,000,000} = 0.04444 = 4.444 \times 10^{-2} = 4.444\%$$

Quadratic Equations

Pythagorean Theorem

- 1) Carl, who is 5'8" tall, is standing 8 feet from a pole which is 20 feet high. He wants to hit the top of the pole with a ball. How far will the ball have to travel to reach the top of the pole?
16.41ft.
- 2) On a bicycle trip, Gina rode her bike up a steep hill. She measured her distance to be 2.5 miles. She knew that the horizontal distance was 1.9 miles. How high was the hill?
1.62 miles

3) Solve for the missing side:

a) $A = 2$
 $B = 2$
 $C = \underline{2.83}$

b) $A = 4$
 $B = 2$
 $C = \underline{4.47}$

c) $A = 4$
 $B = \underline{3}$
 $C = 5$

d) $A = 5$
 $B = \underline{10.9}$
 $C = 12$

e) $A = \underline{24.27}$
 $B = 6$
 $C = 25$

f) $A = \underline{13.23}$
 $B = 15$
 $C = 20$

Quadratic Equations

4) Solve the following quadratic equations:

a) $6x^2 = 37$; $x = \underline{\pm 2.5}$ (rounded)

b) $-8x^2 = -72$ $x = \underline{\pm 3}$

c) $-7x^2 = 7$; $x = \underline{\text{No Solution}}$

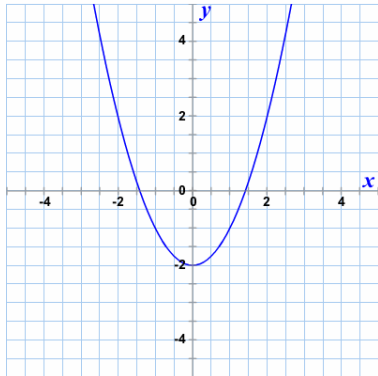
d) $2x^2 - 3 = 39$; $x = \underline{\pm 6}$

e) $-\frac{1}{2}x^2 + 3 = -5$; $x = \underline{\pm 4}$

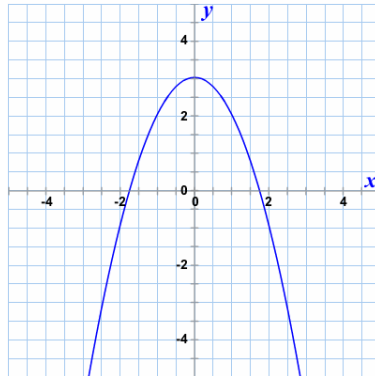
f) $\frac{3}{4}x^2 + 7 = 4$; $x = \underline{\text{No Solution}}$

5) Graph the following quadratic equations:

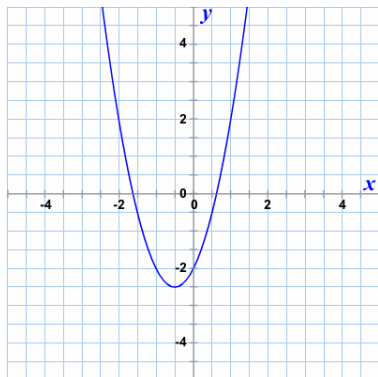
a) $y = x^2 - 2$



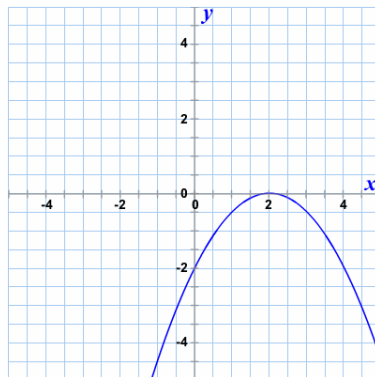
b) $y = -x^2 + 3$



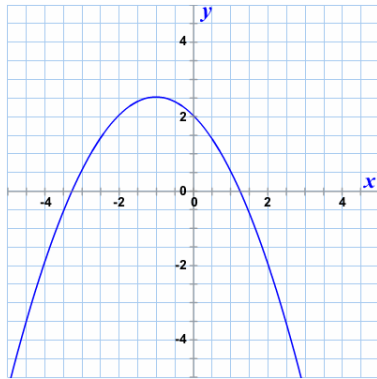
c) $y = 2x^2 + 2x - 2$



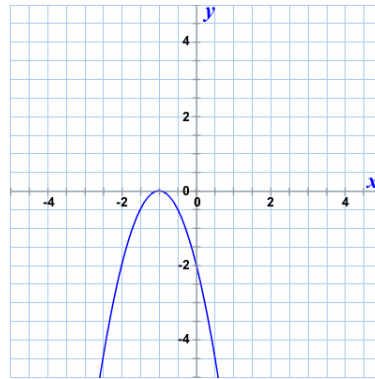
d) $y = -\frac{1}{2}x^2 + 2x - 2$



e) $y = -\frac{1}{2}x^2 - x + 2$



f) $y = -2x^2 - 4x - 2$



Quadratic Formula

6) Using the quadratic formula solve the following:

a) $7x^2 - 5x - 3 = 0$

$x = -0.4$ and $x = 1.1$

c) $7x^2 - 6x + 4 = 0$

No Solution; $x = \sqrt{-76}$

e) $3x^2 + 7x + 2 = 0$

$x = -2$ and $x = -0.3$

b) $-2x^2 - x + 2 = 0$

$x = 0.8$ and $x = -1.3$

d) $-6x^2 + 7x - 2 = 0$

$x = 0.7$ and $x = -0.5$

f) $x^2 - 2x + 1 = 0$

$x = 0$ – only one solution

7) The height (h) of a baseball thrown into the air is modeled over time (t , in seconds) by

$h = -16t^2 + 45t + 0.001$.

a) How long is the baseball in the air? **When $h = 0$ the baseball hits the ground. Solve for the positive t , as the negative solution has no meaning. $t = 2.81$ seconds.**

b) If the baseball had a horizontal velocity of 23 feet per second, how far did it travel?

The distance (d) formula is $d = vt$ or $d = 23t$. With $t = 2.81$, $d = 23(2.81) = 64.63$ feet.

Polynomials & Factoring

Addition and Subtraction

1) Add or subtract the following polynomials:

a)
$$\begin{array}{r} 2n^4 - 3n^3 + 4n + 4 \\ + \quad -7n^4 + 3n^3 + n^2 - 5n \\ \hline -5n^4 + n^2 - n + 4 \end{array}$$

b)
$$\begin{array}{r} 3x^5 - 4x^3 + 2x \\ + \quad -4x^4 + 2x^3 + 3x^2 + 5 \\ \hline 3x^5 - 4x^4 - 2x^3 + 3x^2 + 2x + 5 \end{array}$$

c)
$$\begin{array}{r} 2n^4 - 3n^3 + 4n + 4 \\ - \quad (-7n^4 + 3n^3 + n^2 - 5n) \\ \hline 9n^4 - 6n^3 - n^2 - 9n + 4 \end{array}$$

d)
$$\begin{array}{r} 3x^5 - 4x^3 + 2x \\ - \quad (-4x^4 + 2x^3 + 3x^2 + 5) \\ \hline 3x^5 + 4x^4 - 6x^3 - 3x^2 + 2x - 5 \end{array}$$

2) Multiply the following polynomials:

a) $(7n + 3)(-4n - 6) = -28n^2 - 54n - 18$

b) $(t + 4)^2 = t^2 + 8t + 16$

c) $(x - 8)(x + 8) = x^2 - 64$

d) $(4s - 1)(-9s + 1) = -36s^2 + 13s - 1$

e) $(-9y + 4)(y - 3) = -9y^2 + 31y - 12$

f) $(-5n - 9)(-6n - 9) = 30n^2 + 99n + 81$

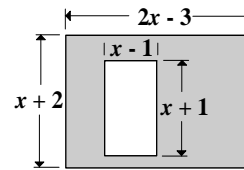
g) $(7s + 2)^2 = 49s^2 + 28s + 4$

h) $(9t + 2)(9t - 2) = 81t^2 - 4$

3) What is the shaded area of the rectangle to the right?

Express the answer in terms of x .

$$x^2 + x - 5$$



4) Factor the following polynomials:

a) $n^2 + 11n + 28 = (n + 4)(n + 7)$

b) $t^2 + 16t + 64 = (t + 8)^2$

c) $x^2 - 2x - 1 = (x - 1)^2$

d) $s^2 + 30s + 42 = \text{No Integer Factor}$

e) $24y^2 + 14y + 2 = (4y + 1)(6y + 2)$

f) $56n^2 + 111n + 54 = (7n + 6)(8n + 9)$

g) $49s^2 + 65 = (7s + 8)(7s - 8)$

h) $t^2 - 25 = (t + 5)(t - 5)$