

# Math 8

Unit 1 Integers

Unit 2 Equations

Unit 3 Exponents

Unit 4 Graphing



Name \_\_\_\_\_

Teacher \_\_\_\_\_

Period \_\_\_\_\_

# Unit 1

## Integers

	Date	Lesson	Topic
		1	Introduction to Integers
		2	Add and Subtract Integers
		3	Multiply & Divide Integers
			Quiz
		4	Order of Operations
		5	Evaluate Algebraic Expressions
		6	Translating Algebraic Expressions
		7	Combine Like Terms (Perimeter Problems)
		8	Distributive Property (Area Problems)
			Review
			Test

**Lesson 1**  
**Introduction to Integers**

**Vocabulary:**

**Integers** - \_\_\_\_\_

**Signed Numbers** - \_\_\_\_\_

**Part 1: Introduction to Integers Examples:**

**Name the Integer**

- 1) 5 degrees above 0      \_\_\_\_\_
- 2) a loss of 2 yards      \_\_\_\_\_
- 3) a withdrawal of \$25      \_\_\_\_\_
- 4) a deposit of \$25      \_\_\_\_\_
- 5) 3 inches of rainfall      \_\_\_\_\_

**Put in order from least to greatest**

- 6) 3, -8, 0, 11, -7      \_\_\_\_\_
- 7) -11, 12, 9, -8, -1      \_\_\_\_\_

**Inequality Symbols**

<	Less than
≤	Less than or equal to
>	Greater than
≥	Greater than or equal to

**Use < or > to make a true statement**

- 8) -2 \_\_\_\_\_ -8
- 9) 0 \_\_\_\_\_ -6
- 10) -5 \_\_\_\_\_ -2
- 11) -8 \_\_\_\_\_ -10

**Try These:**

**Name the Integer**

- 1) 15 feet below sea level \_\_\_\_\_
- 2) 12 inches of snowfall \_\_\_\_\_

**Put in order from least to greatest**

- 3) 10, -5, 1, 12, 0      \_\_\_\_\_
- 4) 55, -25, -11, 52, -74      \_\_\_\_\_

**Use < or > to make a true statement**

- 5) -12 \_\_\_\_\_ -5
- 6) -14 \_\_\_\_\_ 0
- 7) -3 \_\_\_\_\_ -22
- 8) -18 \_\_\_\_\_ -10

## Lesson 1: Homework

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Write the number that describes each situation:

1) loss of 5 kg \_\_\_\_\_

2) gain of 3 kg \_\_\_\_\_

3) rise of 1,500 ft in elevation \_\_\_\_\_

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Put in order from least to greatest

4) 10, -5, 1, 12, 0, -8 \_\_\_\_\_

5) -18, 22, -16, -20, 18, 16, 22, 20 \_\_\_\_\_

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Replace each \_\_\_ With < or > to make a true statement

6)  $7 \underline{\quad} 4$

7)  $6 \underline{\quad} -13$

8)  $-6 \underline{\quad} -3$

9)  $7 \underline{\quad} -3$

10)  $-2 \underline{\quad} 11$

11)  $-14 \underline{\quad} -10$

12)  $-4 \underline{\quad} -9$

13)  $-8 \underline{\quad} 0$

See what you know...Integer Rules

14)  $-8 + 2$

15)  $-6 + -2$

16)  $5 + -2$

17)  $-8 + -3 + -5$

18)  $2 - 12$

19)  $-4 - 8$

20)  $5 - -5$

21)  $-6 - -6$

22)  $(-5)(-5)$

23)  $(3)(-7)$

24)  $-18 \div 0$

25)  $-3 \div -5$

**Lesson 2**  
**Adding and Subtracting Integers**

**Part 1: Rules for Adding Integers**

Signs Same	Signs Different
1) _____ 2) _____	1) _____ 2) _____

**Examples:**

1)  $-2 + -3 =$

2)  $-2 + 8 =$

3)  $-6 + 1 =$

4)  $-4 + 4 =$

5)  $6 + (-3) =$

6)  $10 + -5 + 3 =$

**Try These: Use rules of integers to solve**

1)  $8 + -7$

2)  $-8 + 2$

3)  $-1 + -7$

4)  $-3 + (-3)$

5)  $6 + (-6)$

6)  $-2 + -5 + 3$

## Part 2: Rules for Subtracting Integers

1) \_\_\_\_\_

2) \_\_\_\_\_

### Examples:

1)  $6 - 10$

2)  $-3 - 8$

3)  $4 - -6$

4)  $-2 - (-8)$

5)  $-2 - -2$

6)  $7 + -3$

7)  $-12 - 7 + 4$

8)  $-5 - 6 + 2 - 11$

### Try These:

1)  $5 - 12$

2)  $8 - (-9)$

3)  $-7 - (-10)$

4)  $-4 - -4$

5)  $-8 + 12 - 9 + 4$

6)  $-5 - 6 + 2 - 11$

7)  $8 - 9 + 3 - 7$

**Lesson 2: Classwork**

1)  $-3 + -5$

2)  $7 - 11$

3)  $-9 - -5$

4)  $12 - (-6)$ 

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5)  $9 + -11$

6)  $13 - 14$

7)  $-15 - 10$

8)  $20 + - 13$ 

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9)  $-5 + 9 + -6$

10)  $-16 + 21 - 9$

11)  $-5 + 9 + (-6)$

12)  $-8 + 12 - 3$ 

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13) A football team had a 3 yard gain followed by a 7 yard loss. Find the resulting gain or loss.

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**Lesson 2: Homework****Simplify:**

1)  $-4 + (-4)$

2)  $8 + (-8)$

3)  $-3 - (-8)$

4)  $5 - 9$ 

---

5)  $-3 + 12$

6)  $-6 - 10$

7)  $-2 + 13$

8)  $8 + (-9)$ 

---

9)  $-8 + 12$

10)  $-7 + 5 + 1$

11)  $1 - 6 - 8$

12)  $-8 + 0 + 12$

13)  $7 - 9 - 8 - 5$

14)  $7 - 15 - 2$

15)  $-14 + 16 - 1$

16)  $-5 + 1 - 8 + 7$

---

17)  $-30 + 8 - 23$

18)  $-11 + 2 - 18$

19)  $-43 + 6 + 13$

20)  $-35 - 8 + 11$

---

21)  $6 - (-4) - 5 + 18$

22)  $0 - 15 + 12$

23)  $8 - 11 + (-66) - 4$

24)  $20 - 6 - 22$

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25) An elevator began on the fourth floor. It went up 6 floors, dropped 3 floors, and then went up another two floors. What floor did the elevator stop on?

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26) On Monday afternoon the temperature was  $6^{\circ}$ . That night it dropped  $8^{\circ}$ . What was the temperature on Tuesday morning?

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27) In the morning, Mrs. Boxer deposited \$135 to her bank account. She withdrew \$235 in the afternoon. What number describes her account's net change?

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28) The New York Giants completed a pass for a gain of 25 yards. After the play was over, a flag was thrown and a 10-yard penalty was called against the team. What was the net result of the play?



**Lesson 3**  
**Multiplying and Dividing Integers**

**Do Now:**

1)  $6 - 12 + 4$

2)  $7 + 8 - 4$

3)  $-9 - 4 - 1$

4)  $-6 - 13 - 3$

5)  $8 - 6 - 9$

6)  $-9 - 9 + 14$

**Part 1: Rules for Multiplying and Dividing Integers:**

<b>Odd</b> number of negative signs	Answer – <b>Negative</b>
<b>Even</b> number of negative signs	Answer – <b>Positive</b>

**Steps for Multiplying and Dividing**

1) _____
2) _____

**Examples:**

1)  $(-6)(-2)$

2)  $(5)(-3)$

3)  $(-5)(0)$

4)  $(6)(-2)(3)(-1)(-4)$

5)  $(-2)(1)(-3)(4)$

6)  $(-1)^3$

7)  $(-1)^{246}$

8)  $(-1)^{485}$

9)  $\frac{-25}{5}$

10)  $-36 \div -9$

11)  $\frac{0}{8}$

12)  $\frac{8}{0}$

**Zero Rules:**

When 0 is in the numerator of a fraction the answer is \_\_\_\_\_.

When 0 is in the denominator of a fraction the answer is \_\_\_\_\_.

\*\*\* Remember ..... When 0 is **U**nderneath the answer is **U**\_\_\_\_\_

## Part 1: Try These

- 1)  $(7)(5)$       2)  $(4)(-9)$       3)  $\frac{-32}{4}$       4)  $4.5 \div -0.9$
- 5)  $\frac{-28}{2}$       6)  $(-8)(-5)$       7)  $\frac{-3}{0}$       8)  $(-6)(7)$
- 9)  $\frac{0}{5}$       10)  $(-2)(5)(-3)(-2)(6)(-4)$       11)  $-2 \div 0$       12)  $(-38)(24)(96)(0)$

## Part 2: Using a Calculator

### How to input fractions into the calculator

You must use the  $\boxed{a \frac{b}{c}}$  button!

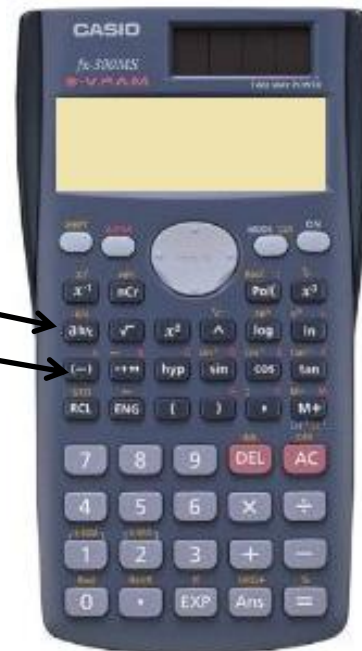
Use  $\boxed{(-)}$  if you need to make a number negative.

- Simple fractions such as  $\frac{1}{2}$  are entered as:

$\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{2}$

- Mixed numbers such as  $-1\frac{1}{2}$  are entered as:

$\boxed{(-)}$   $\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{2}$



### Examples:

1)  $\frac{1}{4} + \frac{2}{3} =$

Enter the following:  $\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{4}$   $\boxed{+}$   $\boxed{2}$   $\boxed{a \frac{b}{c}}$   $\boxed{3}$  = \_\_\_\_\_

2)  $1\frac{3}{4} - 2\frac{1}{3} =$

Enter the following:  $\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{3}$   $\boxed{a \frac{b}{c}}$   $\boxed{4}$   $\boxed{-}$   $\boxed{2}$   $\boxed{a \frac{b}{c}}$   $\boxed{1}$   $\boxed{a \frac{b}{c}}$   $\boxed{3}$  = \_\_\_\_\_

3)  $6\frac{3}{4} \div -\frac{1}{2} =$

Enter the following:                 = \_\_\_\_\_

4)  $5\frac{1}{2} \times 2\frac{3}{4} =$

Enter the following:                    = \_\_\_\_\_

**Examples:**

5)  $\frac{3}{11} + \frac{7}{20}$

6)  $-\frac{5}{4} - \frac{3}{4}$

7)  $-\frac{2}{3} \times \frac{5}{4}$

8)  $\frac{1}{9} \div -1\frac{1}{3}$

**Part 2 - Try These: (Let's use the calculator!)**

Mixed Practice with fractions

1)  $\frac{3}{7} - \frac{1}{2}$

2)  $\frac{1}{3} - (-\frac{1}{3})$

3)  $\frac{4}{9} \times \frac{7}{4}$

4)  $-2 \div -3\frac{4}{5}$

**Lesson 3: Classwork**

1)  $(6)(-7)$

2)  $(-3)(-9)$

3)  $(-9)(0)$

4)  $(-4.2)(0.3)$

5)  $-100 \div -10$

6)  $35 \div -7$

7)  $-12 \div 0$

8)  $0 \div 17$

9)  $6 - \frac{1}{6}$

10)  $-3\frac{5}{9} \div 3$

11)  $-2\frac{2}{3} \times 4\frac{1}{10}$

12)  $\frac{4}{5} + 0$

### Lesson 3: Homework

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#### Simplify Using the Rules of Integers:

1)  $(-3)(9)$

2)  $(-5)(-1)$

3)  $(-9)(0)$

4)  $(-7)(-3)$

5)  $(-24)(-5/8)$

6)  $(-2/3)(-18)$

7)  $(7)(-1)(0)(-8)$

8)  $(-4)(-2^3)$

9)  $\frac{-52}{5}$

10)  $-18 \div -9$

11)  $\frac{0}{7}$

12)  $\frac{3}{0}$ 

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#### Using a Calculator

13)  $\frac{3}{5} - \frac{2}{3}$

14)  $\frac{1}{3} \div (-\frac{1}{3})$

15)  $\frac{5}{9} \times \frac{7}{15}$

16)  $\frac{1}{5} + (-\frac{1}{5})$

17)  $\frac{7}{6} - \frac{5}{6}$

18)  $0 \div \frac{4}{9}$

19)  $-2 \times \frac{3}{7}$

20)  $-5\frac{5}{8} \times -4\frac{2}{10}$ 

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#### Mixed Review:

21)  $-5 - 6$

22)  $(-5)(-6)$

23)  $(-2)(8)$

24)  $-2 + 8$

25)  $12 \div -4$

26)  $-4 + 12$

27)  $-9 - 3$

28)  $-9 \cdot -3$ 

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Decide which operation to solve the following word problems.

Use your calculator to solve.

- 29) John's family went for a trip. To make the journey interesting, they traveled first  $53\frac{1}{4}$  miles by car and the remaining  $10\frac{2}{3}$  miles by horse. What was the total distance of the trip?
- 

- 30)  $\frac{4}{7}$  of birthday cake was eaten on your birthday. The next day your dad ate  $\frac{1}{2}$  of what was left. You get to finish the cake. How much was left?

**Lesson 4**  
**Order of Operations**

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**Do Now: Mixed Review**

**Non Calculator**

1)  $3 - 8$

2)  $-5(4)$

3)  $-6 + -3$

4)  $-18 \div 6$

5)  $20 - (-3)$

---

6)  $(-1)^{863}$

7)  $14 + -17$

8)  $-100 \div 0$

9)  $-21 - 30$

10)  $(-2)(3)(-1)(-6)(-2)$

---

**Using a Calculator**

11)  $\frac{9}{15} - 9$

12)  $\frac{-4}{8} \div \frac{3}{5}$

13)  $-3 - 3 - 3$

14)  $-7 + 7$

15)  $6 \div -8$

---

16) The recipe for mint chocolate chip ice cream requires  $2\frac{1}{4}$  cups of cream for 5 people. You need ice cream for 8 people. How much cream will you need?

## Lesson 4: Order of Operations

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Some mathematical expressions involve several operations. Does the order in which these operations are done make a difference?

$$\boxed{6 + 3} \times 4$$

$$9 \times 4 = 36$$

$$6 + \boxed{3 \times 4}$$

$$6 + 12 = 18$$

Which is correct, and why?

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Use the acronym **PEMDAS** to help you determine the order.

**P** \_\_\_\_\_

**E** \_\_\_\_\_

**M** \_\_\_\_\_

**D** \_\_\_\_\_

**A** \_\_\_\_\_

**S** \_\_\_\_\_

---

**Examples:**

1)  $5 + 2 \times 6$

2)  $10 \div 5 \times 2$

3)  $7(1 + 2) - 5 \div 5$

4)  $\frac{3 \cdot 4 + 8}{15 - 2 \cdot 5}$

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5)  $-4 + (-5)(3)$

6)  $-9 + (-4)(-2)$

7)  $8 + 5 \times (12 - 6 \div 3)$

8)  $4^2 - 2 \cdot 5 + (8 - 2)$

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9)  $3(2)^2 + 2(4) - 7$

10)  $\frac{4(5) + 16}{3^2 - 3}$

11)  $4 - 3 + 7(12 - 2^2)$

12)  $\frac{2}{3}(9) - 4$

**Try These:**

1)  $3 + 5 \cdot 6$

2)  $27 \div 3 - 5$

3)  $6 - 36 \div 9$

4)  $(-7)(4) - 8$

5)  $-18 + (-7)(-4)$

6)  $14 - 16 \div 8 + 9 \cdot 5$

7)  $0.34 + 2.4(3)$

8)  $\frac{2}{5}(15) + 4^2$

9)  $9 \cdot 3 + 40 - 24 \div 3 + 6 \cdot 2 - 1$

10)  $14 \div 0$

11)  $0 \div 42$

**Lesson 4: Classwork/Homework**

1)  $8 + 4 \times 2$

2)  $16 - 32 \div 4$

3)  $5 + 7(2)$

4)  $9 - 14 \div 2 + 3 \times 4$

5)  $7 \times 8 - 4 \div 2 + 5 \times 6$

6)  $14 - 16 \div 8 + 9(5)$

7)  $2 + 7 \times 4 - 15 \div 3 + 7$

8)  $20 \div 4 + 3 \times 6 - 12 \div 4$

9)  $8(4) + 9 \div 3 - 1 \times 5$

10)  $3(8 - 4) + 6$

11)  $(7 - 5)6 + 4$

12)  $10 - 3(5 - 2)$

13)  $2(3 + 4) - 35 \div 7$

14)  $15 + 2^3 \div 4 \cdot 5$

15)  $24 \div 6 + 3^3 - 5(2) + (36 \div 4)$

16)  $\frac{5(9) + 18 \div 3}{2 + 3(5)}$

17)  $(0.9)(0.2) + (0.6)(0.4)$

18)  $(\frac{4}{5})(35) - 14 \div 7$

**Lesson 5**  
**Evaluating Algebraic Expressions**

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**Do Now:**

1)  $-43 + 6 + 13$

2)  $-5 + 1 - 8 + 7$

3)  $7 \cdot 5 + 6^2$

4)  $60 - 3 \cdot 4^2$

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5) The grocery store parking lot will hold 1000 vehicles.  $\frac{2}{5}$  of the parking spaces are for cars. When you went to buy groceries there were 200 cars and some trucks in the parking lot. The parking lot was  $\frac{3}{4}$  full. How many trucks were in it?

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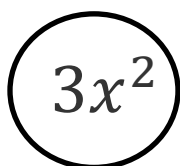
**Vocabulary:**

**Expression** - \_\_\_\_\_

**Equation** - \_\_\_\_\_

**Evaluate** - \_\_\_\_\_

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Name the coefficient: \_\_\_\_\_ **Coefficient** - \_\_\_\_\_

Name the variable: \_\_\_\_\_ **Variable** - \_\_\_\_\_

Name the exponent: \_\_\_\_\_ **Exponent** - \_\_\_\_\_

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**Steps to Evaluating Algebraic Expressions Problems**

1 - \_\_\_\_\_

2 - \_\_\_\_\_

3 - \_\_\_\_\_



## Examples:

Evaluate the following expressions:

1)  $3x - 2$  for  $x = 4$

2)  $5(x + 3)$  when  $x = 2$

3)  $-13 - 5x$  if  $x = -2$

4)  $2a^5$  if  $a = 3$

5)  $(2a)^5$  when  $a = 3$

6)  $\frac{3a + 6}{2b - 3c}$  if  $a = 8$ ,  $b = 6$ ,  $c = 2$

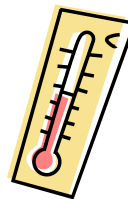
7)  $5x - 2y$  if  $x = 3$ ;  $y = 6$

8)  $\frac{2}{5}x + 3$  for  $x = 20$

9)  $3x + 5y - 8$  for  $x = 3.1$ ;  $y = -.8$

## Conversion Formulas

Fahrenheit $\rightarrow$ Celsius	Celsius $\rightarrow$ Fahrenheit
$C = \frac{5}{9}(F - 32)$	$F = \frac{9}{5}C + 32$



Convert the following temperatures:

10)  $50^\circ \text{C} = \underline{\hspace{2cm}} \text{F}$

11)  $113^\circ \text{F} = \underline{\hspace{2cm}} \text{C}$

**Try These:**

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**Evaluate the following expressions:**

1)  $19 - 2m$  for  $m = 6$

2)  $ab^4$  if  $a = 3$ ;  $b = 2$

3)  $3x^2$  if  $x = 4$

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4)  $(3x)^2$  when  $x = 4$

5)  $2x - 3y$  for  $x = -8$ ,  $y = -4$

6)  $\frac{3a-8}{2b+4}$  for  $a = -2$  and  $b = -3$

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7)  $-5m - 6p + 8k$  for  $m = -1$ ,  $p = -2$ ,  $k = -0.3$

8)  $(4x + 3y)2 + 9$  for  $x = -\frac{1}{2}$  and  $y = -\frac{2}{3}$

---

Convert the following temperatures:

9)  $77^\circ \text{F} = \underline{\hspace{2cm}} \text{C}$

10)  $35^\circ \text{C} = \underline{\hspace{2cm}} \text{F}$

## Lesson 5: Classwork/Homework

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Evaluate the following expressions:

1)  $3x + 4$  for  $x = 6$

2)  $10 - 3y$  for  $y = 2$

3)  $8 + 6a$  for  $a = 3$

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4)  $3a - 2 + 5b$  for  $a = 6, b = 2$

5)  $5a - 4b + 9$  for  $a = 7, b = 2$

6)  $\frac{2}{5}a - 3$  for  $a = 10$

---

7)  $3a^5$  for  $a = 2$

8)  $6 - 2x$  for  $x = 5$

9)  $-2x - 13$  for  $x = -3$

---

10)  $-2x + 8$  for  $x = -2$

11)  $4g - 5$  for  $g = -7$

12)  $4a - 3b$  for  $a = -5, b = 2$

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13)  $3d - 6e$  for  $d = 5, e = 0.2$       14)  $6x - 4y$  for  $x = -\frac{2}{3}, y = -3$       15)  $\frac{3x+2y}{2x+y}$  for  $x = -4, y = 3$

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16) What is  $194^\circ \text{F}$  in Celsius?

17) What is  $120^\circ \text{C}$  in Fahrenheit?

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18) Use the formula  $h = 60t - 5t^2$ , to answer the following question. If an object is shot upward from the ground, what is its height ( $h$ ) above the ground after 5 seconds ( $t$ )?

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**To find the value of  $2x - 10$  when  $x = 2$**

(Remember you must follow the rules of evaluating algebraic expressions)

19) First I \_\_\_\_\_

20) Then I \_\_\_\_\_

21) Then I \_\_\_\_\_

22) Finally I \_\_\_\_\_

## Lesson 6 Translating Algebraic Expressions

### Do Now:



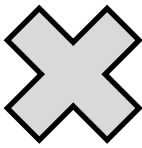
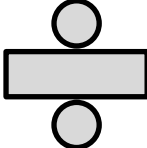
- 1)  $-4 + (-5)(3)$                       2) Which answer is greater?  $(3x)^2$  or  $3x^2$  when  $x = 2$
- 3) What is the difference between an expression and an equation.

\_\_\_\_\_

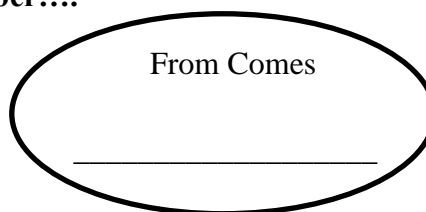
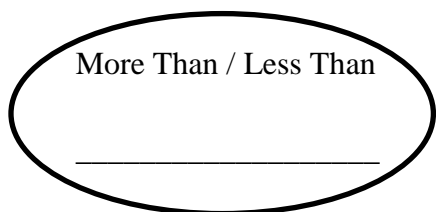
\_\_\_\_\_

### Vocabulary:

- Sum** - \_\_\_\_\_
- Difference** - \_\_\_\_\_
- Product** - \_\_\_\_\_
- Quotient** - \_\_\_\_\_

$x + 5$	$x - 5$	$5x$	$\frac{5}{x}$
<ul style="list-style-type: none"> <li>• <math>x</math> plus 5</li> <li>• the sum of <math>x</math> and 5</li> <li>• <math>x</math> increased by 5</li> <li>• <b>5 more than <math>x</math></b></li> <li>• <b>5 added to <math>x</math></b></li> </ul>	<ul style="list-style-type: none"> <li>• <math>x</math> minus 5</li> <li>• the difference of <math>x</math> and 5</li> <li>• <math>x</math> decreased by 5</li> <li>• <b>5 less than <math>x</math></b></li> <li>• <b>5 subtracted from <math>x</math></b></li> </ul>	<ul style="list-style-type: none"> <li>• 5 times <math>x</math></li> <li>• the product of 5 and <math>x</math></li> <li>• 5 multiplied by <math>x</math></li> </ul>	<ul style="list-style-type: none"> <li>• 5 divided by <math>x</math></li> <li>• The quotient of 5 and <math>x</math></li> </ul>
			

### Remember....



### Examples:

- 1) 3 times a number plus 6    \_\_\_\_\_
- 2) 4 less than a number times 2    \_\_\_\_\_
- 3)  $x$  divided by 8    \_\_\_\_\_
- 4) 12 subtracted by  $x$     \_\_\_\_\_

**Try These: Matching**

- |                              |             |
|------------------------------|-------------|
| ___ 1) $n$ increased by 11   | A) $n - 19$ |
| ___ 2) 11 less than $n$      | B) $n + 11$ |
| ___ 3) the sum of $n$ and 19 | C) $n + 19$ |
| ___ 4) 11 more than $n$      | D) $n - 11$ |
| ___ 5) $n$ increased by 19   | E) $19 - n$ |
|                              | F) $11 - n$ |
- 

**Lesson 6: Classwork**

Write each as an algebraic expression

- \_\_\_\_\_ 1)  $m$  increased by 8
- \_\_\_\_\_ 2) 4 less than  $c$
- \_\_\_\_\_ 3) the sum of  $b$  and 14
- \_\_\_\_\_ 4) 7 decreased by  $k$
- \_\_\_\_\_ 5) 3 more than twice  $d$
- \_\_\_\_\_ 6) 17 increased by 5 times  $r$
- \_\_\_\_\_ 7) 4 less than 6 times  $w$
- \_\_\_\_\_ 8) 8 increased by 7 times a number
- \_\_\_\_\_ 9) twice Don's age increased by 8
- \_\_\_\_\_ 10) 40 more than Meg's bowling score
- \_\_\_\_\_ 11) the sum of 32 and twice a number
- \_\_\_\_\_ 12) Abe's savings decreased by \$540
- \_\_\_\_\_ 13) 24 decreased by 4 times a number
- \_\_\_\_\_ 14) Bill's batting average increased by 12
- \_\_\_\_\_ 15) 8 times a number, decreased by 14
- \_\_\_\_\_ 16) the product of  $x$  and  $y$
- \_\_\_\_\_ 17) 11 more than  $x$  times  $y$
- \_\_\_\_\_ 18) the quotient of  $x$  and 8
- \_\_\_\_\_ 19) the difference of  $x$  and 7
- \_\_\_\_\_ 20) 3 less than 4 times a number

## Lesson 6: Homework

---

- \_\_\_\_\_ 1)  $w$  decreased by 4
  - \_\_\_\_\_ 2) 2 more than  $u$
  - \_\_\_\_\_ 3) the sum of  $m$  and 3
  - \_\_\_\_\_ 4) 9 less than  $x$
  - \_\_\_\_\_ 5) 7 less than three times  $x$
  - \_\_\_\_\_ 6) 14 decreased by 3 times a number
  - \_\_\_\_\_ 7) 3 more than 8 times  $e$
  - \_\_\_\_\_ 8) 5 decreased by 3 times a number
  - \_\_\_\_\_ 9) 12 more than twice  $m$
  - \_\_\_\_\_ 10) 8 less than a number divided by 5
  - \_\_\_\_\_ 11) \$60 more than 6 times Ben's salary
  - \_\_\_\_\_ 12) The sum of 25 and 3 times Joe's age
  - \_\_\_\_\_ 13)  $3^\circ$  more than the temperature
  - \_\_\_\_\_ 14) 13 less than 6 times a number
  - \_\_\_\_\_ 15) 7 more than twice the length of a rectangle
  - \_\_\_\_\_ 16) a number divided by 2, increased by 4
  - \_\_\_\_\_ 17)  $x$  subtracted from 12
  - \_\_\_\_\_ 18)  $x$  less than  $a$  divided by  $b$
  - \_\_\_\_\_ 19) the product of  $x$  and 11
  - \_\_\_\_\_ 20) 5 added to  $x$
- 

### Extended Response: Translate and Solve:

- 21) The difference of 8 and -9      22) The quotient of -36 and 12      23) The sum of -5 and -8
- 

- 24) The product of -2 and -6      25) 7 subtracted from -10      26) 8 less than 10
- 

27) An elevator began on the fourth floor. It went up 6 floors, dropped 3 floors, and then went up another two floors. What floor did the elevator stop on?

---

28) On Monday afternoon the temperature was  $6^\circ$ . That night it dropped  $8^\circ$ . What was the temperature on Tuesday morning?

## Lesson 7 Combining Like Terms

---

### Do Now:

- 1) Evaluate  $5x^3$  when  $x = 2$
- 2) Simplify:  $12 - 2^3 + 24 \div 8 - 4$
- 3) In the morning, Mrs. Boxer deposited \$135 to her bank account. She withdrew \$235 in the afternoon. What number describes her account's net change?

---

### Vocabulary:

- Polynomial** - \_\_\_\_\_
- Monomial** - \_\_\_\_\_
- Binomial** - \_\_\_\_\_
- Trinomial** - \_\_\_\_\_
- Constant** - \_\_\_\_\_
- Like terms** - \_\_\_\_\_
- Perimeter** - \_\_\_\_\_

---

### Examples: Polynomial Facts

Classify each polynomial as either a monomial, binomial, or trinomial.

- 1)  $2x^2 + 3x - 1$
- 2)  $6xy$
- 3)  $-7m^5$
- 4)  $5y^2 - 2$

---

### What is the constant if each polynomial?

- 5)  $7x + 4x + 8$
- 6)  $2x^2 - 1$
- 7)  $b^2 - 7b + 4$
- 8)  $3x^2 - 5x$

---

### Determine if the following are like terms or unlike terms:

- 9)  $3x + 2x^2$
- 10)  $5xy + x$
- 11)  $x^2y - xy^2$
- 12)  $4y^2 - 2y^2$
- 13)  $0.1ab$  and  $4ab$
- 14)  $x^2y$  and  $-5x^2y$
- 15)  $-2ab^2$  and  $-2a^2b$
- 16)  $3x^2$  and  $5x^4$



**Rule: Combining Like Terms**

---

**Examples:** Simplify by combining like terms:

1)  $6x + 3x$

2)  $5x + x$

3)  $2x + 7$

4)  $-9x + 4x$

5)  $-2a - 11a$

6)  $-2a + 3a$

7)  $-3x - 2x + 5$

8)  $10y - 3y - y$

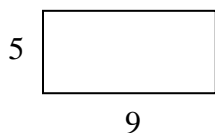
9)  $9y - 3 + 6y - 8$

10)  $9x + 4y$

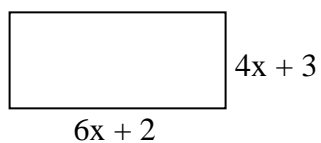
11)  $-7x + 7x + 3$

12)  $-4x - -3x$

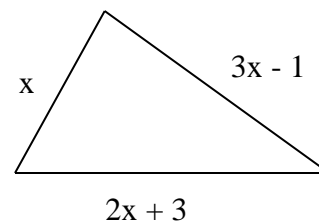
13) Find the perimeter



17) Find the perimeter



18) Express the perimeter in terms of  $x$ :



**Try These:**

**Classify each polynomial as either a monomial, binomial, or trinomial.**

1)  $24xyz$

2)  $7x + 5$

3)  $2x^2 + 4x - 1$

4)  $x^2 + y^2$

---

**What is the constant if each polynomial?**

5)  $6 + 7x$

6)  $2x^2 - 15x + 1$

---

**Determine if the following are like terms or unlike terms:**

7)  $4x + 4x^2$

8)  $5xy + xy$

---

**Simplify by combining like terms:**

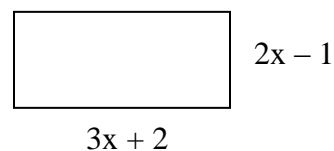
9)  $8y - 5a + 8y - 5a$

10)  $4a - 7 + 5a + 10 - 3a$

---

11)  $6x^2 + 3x - 8x^2$

12) Express the perimeter in terms of  $x$ :



13) What is the perimeter of a triangle whose sides are  $x + 8$ ,  $x + 5$ , and  $2x - 6$  ?

## Lesson 7: Classwork

---

- 1) What is the coefficient of  $p$  in  $a + 7p - 21$ ? \_\_\_\_\_
  - 2) What are the like terms of  $7r + 5 + 3r$ ? \_\_\_\_\_
  - 3) What is the coefficient of  $a$  in the expression  $4c + 5 + a$ ? \_\_\_\_\_
  - 4) What is the constant in  $5x^2 + 2x$  \_\_\_\_\_
  - 5) What are the steps in simplifying  $8x + 3 + x + 9$ ? \_\_\_\_\_
- 

### Simplify by combining like terms:

6)  $2r + 8 + r$

7)  $8 + 4z + 8k$

8)  $9 + 3m + m$ 

---

9)  $7 + 6y - 2 - 4y$

10)  $8 + 11m - 5 - 7m$

11)  $-x - x + 2x$ 

---

12)  $x + 9 + x - 8 + 3c$

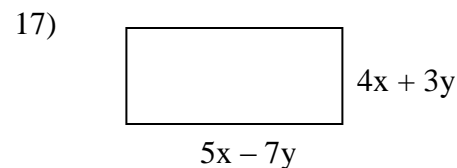
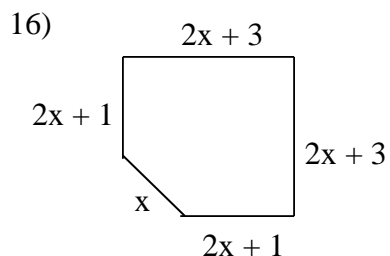
13)  $8xy + 4a - 9xy - 6a - 7a$

14)  $6g + 14 + 3g + g - 5$ 

---

- 15) What is the perimeter of a quadrilateral whose sides are  $7x - 10$ ,  $4x + 8$ ,  $2x + 12$ , and  $5x - 10$
- 

Express the perimeter in terms of  $x$ :



## Lesson 7: Homework

**Simplify by combining like terms:**

1)  $-6b + 5b$

2)  $-3a + 4a$

3)  $-k + 2k$

4)  $-8 + 5b + 2 - b$

5)  $-3x - 2 + x - 7$

6)  $9y - 2 - y + 4$

7)  $7x - x + 3x$

8)  $8d - d - d$

9)  $4a - 6a - a$

10)  $7k - 8k - k$

11)  $5t - 6 - t - 8$

12)  $-m - 14 - m + 6$

13)  $g - 5 - 2g + 10$

14)  $-7 - z - 3z + 2$

15)  $c + 8 - 2c - 9$

16)  $-4k - 3m + 3k + m$

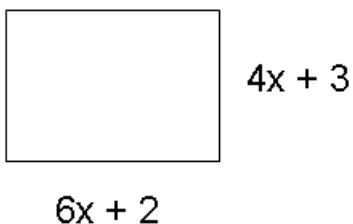
17)  $-6a + 7b - a - 8b$

18)  $-2d + 9f - 6f + d$

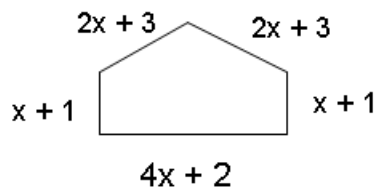
19)  $8y + z - 9y - 2z + 3$

**Express the perimeter in terms of x:**

20)



21)



**Mixed Review:**

22) Evaluate  $5x - 2y - 7$  for  $x = -2$ ,  $y = 4$

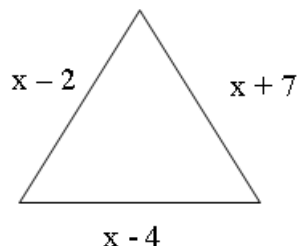
23)  $-1 - 5$

24)  $-8x - 4$

## Lesson 8 Distributive Property

### Do Now:

1) Express the perimeter in terms of  $x$ :



2) Simplify and Evaluate: when  $x = 2$  and  $y = 3$

$$6 + 7x + 9y + 3x - 2 - 4y$$

### Vocabulary:

**Distributive Property** - \_\_\_\_\_

**Area** - \_\_\_\_\_

### Examples:

1)  $2(x + 3)$

2)  $2(4x - 5y)$

3)  $3(4x + 5y - 6z + 8)$

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

5)  $-6(7k + .5)$

6)  $\frac{1}{3}(15x + 27)$

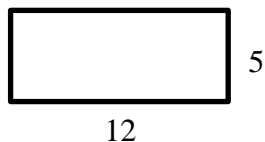
7)  $\frac{3}{4}(7n + 1)$

8)  $-4(1 + 11x) + 20x$

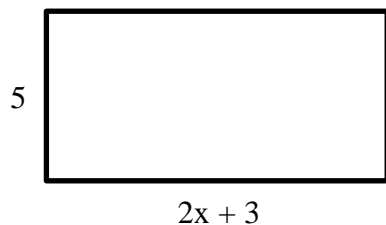
9)  $-3(5x - 1) - 8x$

10)  $9(3 - 10n) - 3(10n + 1)$

11) Find the area:



12) Find the area:



13) Find the area of a rectangle whose width is 6 and length is  $(x + 7)$ .

**Lesson 8: Try These**

---

1)  $3(4 + 3y)$

2)  $-2(6x - 8)$

3)  $\frac{1}{2}(8n + 2)$

4)  $-(-2 - n)$ 

---

5)  $-3(x - 2.6)$

6)  $8 + \frac{1}{7}(7n - 14)$

7)  $4x + 5(3x - 3)$

8)  $5(-8n + 5) - 4n$ 

---

9)  $-4(3x - 3) + 9(x + 1)$

10)  $10.8(x - 3.6)$

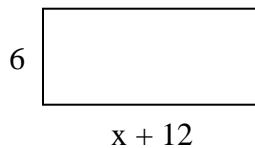
11)  $-\frac{5}{4}(4n - 3)$

12)  $-2(-8x - 10)$ 

---

Express the area in terms of  $x$ :

13)

Express the perimeter in terms of  $x$ :

14)



## Lesson 8: Classwork/Homework

1)  $5(3x - 4)$

2)  $3(2x + 7y)$

3)  $-6(1 + 11b)$

4)  $-10(a - 5)$

5)  $-(-6x + 9)$

6)  $-2(3x + .6)$

7)  $\frac{3}{4}(7n + 1)$

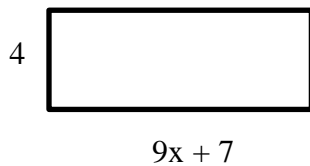
8)  $2(1 - 4.3k) - 2$

9)  $-9(3 - 10n) - 3$

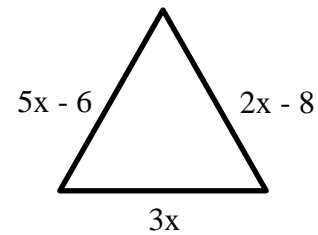
10)  $4(7 - 5n) - 2(3n + 4)$

\*Challenge\* 11)  $7(2x^2 - 3x) + 10x$

12) Find the area of the rectangle.



13) Find the perimeter of the triangle.



14) If Lisa's yard has a length of 9 and a width of  $x - 2$ .

A) Express the amount fertilizer she will need in terms of  $x$ .



B) Express the amount of fence she would need to enclose her yard in terms of  $x$ .

**Introduction to Integers**

Write the number that best describes the situation:

1) A gain of 20 yards

2) A withdrawal of 100 dollars

Compare: Use  $<$  or  $>$ 3)  $-10$  \_\_\_\_\_  $-9$ 4)  $-1$  \_\_\_\_\_  $-7$ **To add, subtract, multiply and divide signed numbers**Simplify (*round to the nearest tenth if necessary*)

5)  $-15 + 8$

6)  $5 - (-6)$

7)  $10 + (-6)$

8)  $-22 - 13 + -6$

9)  $-9\frac{2}{3} - (-3)$

10)  $(-4)(-5\frac{1}{2})$

11)  $(-1)(5)(-3)$

12)  $\frac{8}{0}$

13)  $26 \div -13$

14)  $(-0.27)(-0.6)$

15)  $-2\frac{5}{8} \div -\frac{4}{12}$

16) The elevator begins on the fifth floor and goes up 5 floors, and goes down 7 floors. What floor is the elevator on now?



## Order of Operations

Simplify

17)  $-25 + 3 - 7$

18)  $52 + (-5)(7)$

19)  $3 \times 2^2 + 24 \div 8$

20)  $(15 \div 3)^2 + 9 \div 3$

---

## Evaluating

Simplify (*round to the nearest tenth if necessary*)

21) Evaluate  $3x + 8y$  for  $x = -1$  and  $y = -4$

22) Evaluate  $\frac{3}{5}x - 6y$  for  $x = -5$  and  $y = -4$

---

23) Evaluate  $\frac{5x+9}{x-6}$  for  $x = 3$

24) Evaluate:  $3.3p + 2$  for  $p = 9$

---

25) Convert 9 degrees Celsius to Fahrenheit. (Round to the nearest tenth)  $F = \frac{9}{5}C + 32$

---

26) Convert 59 degrees Fahrenheit to Celsius.  $C = \frac{5}{9}(F-32)$

---

## Combine Like Terms

27)  $-5x - 7x$

28)  $6x - 9y + 4x - y$

29)  $10x - 6x - 4x$

**Translate each expression:**

30) 7 more than twice the length of a rectangle

31) a number divided by 2, increased by 4

32)  $x$  subtracted from 12

33)  $x$  less than a divided by  $b$

---

**Translate and Solve:**

34) The difference of 8 and  $-9$

35) The quotient of  $-36$  and 12

36) The sum of  $-5$  and  $-8$

---

**37) Express the perimeter in terms of  $x$ :**

$$7x + 2$$



$$3x - 8$$

---

**Distributive Property:**

38)  $3(2x + 5) - 5$

39)  $-(5x - 8)$

40)  $25 - (-5x + 10)$

41)  $(10x + 2)6 + 3x$

---

42)  $\frac{3}{4}(3x - 4)$

43) Find the area of a rectangle that has a width of 4 and a length of  $2x - 8$ .

# Unit 2

## Solving Equations

	Date	Lesson	Topic
		1	One Step and Two Step Equations
		2	Like Term Equations
		3	Variables on Both sides
		4	Distribute Equations
		5	Multi Step Equations
			Quiz
		6	Equation Solutions
		7	Decimal Equations
		8	Fractional Equations
			Review
			Test

**Lesson 1**  
**Solving One and Two Step Equations**

**Vocabulary:**

Inverse Operations - \_\_\_\_\_

\*Remember, whatever you do on one side of an equation \_\_\_\_\_.

**Rules:**

- |          |
|----------|
| 1) _____ |
| 2) _____ |
| 3) _____ |
| 4) _____ |

**Examples: (Solve for the variable)**

1)  $x + 8 = 20$

2)  $x - 4 = 10$

3)  $x + 3 = 3$

4)  $x + 8 = 1$

5)  $x - 5 = 6$

6)  $-10 = x + 6$

7)  $-x = 10$

8)  $-x = -10$

9)  $4x = 2$

10)  $-25 = -5x$

11)  $\frac{x}{3} = 7$

12)  $\frac{x}{4} = -8$

13)  $2x + 8 = 20$

14)  $\frac{x}{4} - 3 = 27$

15)  $13 = 3x - 8$

16)  $\frac{x}{4} + 12 = -4$

17)  $16 - 4y = -8$

18)  $4x - 3 = -15$

19)  $6 + \frac{x}{-3} = 8$

20)  $80 + 32x = 400$

---

Write an equation and solve

21) The \$54 selling price of a sweater is the cost increased by \$18. Find the cost.

22) If you multiply John's age by 4 and then subtract 2, you get 10. What is John's age?

---

**Try These:**

Use the equation  $4x = -24$  to answer questions 1 – 4

1) What is being done to x? \_\_\_\_\_

2) How do you undo what is being done to x? \_\_\_\_\_

3) What must you do to each side of the equation to solve for x? \_\_\_\_\_

\_\_\_\_\_

4) What is the value of x? \_\_\_\_\_

---

Use the equation  $\frac{x}{-3} = 4$  to answer questions 5 – 8

5) What is being done to x? \_\_\_\_\_

6) How do you undo what is being done to x? \_\_\_\_\_

7) What must you do to each side of the equation to solve for x? \_\_\_\_\_

\_\_\_\_\_

8) What is the value of x? \_\_\_\_\_

$$9) 19 = n + 32$$

$$10) \frac{x}{-5} = -7$$

$$11) -x = 36$$

$$12) -x = -8$$

---

$$13) 4 - x = 10$$

$$14) 10 + 2a = 22$$

$$15) -19 - 6y = 21$$

$$16) -x + 3 = -15$$

---

$$11) -3 - 4x = -15$$

$$12) 14 = \frac{y}{3} + 11$$

13) Write an equation and solve:

A number divided by 5 is 23? Find the number

---

**Lesson 1: Classwork** (Solve for the variable)

$$1) x + 2 = -8$$

$$2) x + 6 = 3$$

$$3) x - 7 = 8$$

$$4) x - 4 = -4$$

---

$$5) -2x = -12$$

$$6) 5x = 4$$

$$7) -x = 3$$

$$8) -x = -6$$

---

$$9) \frac{x}{3} = -9$$

$$10) \frac{x}{-2} = -7$$

$$11) 5x = 5$$

$$12) 3x = 0$$

---

13)  $3x + 7 = -11$

14)  $-2x + 6 = -8$

15)  $\frac{x}{5} + 2 = 9$

16)  $-4k - 8 = 20$

---

17)  $4 = 9g - 50$

18)  $8 + 2a = -34$

19)  $-4 = -10 - 2e$

20)  $-6 - 4w = -18$

---

21)  $5 + \frac{n}{7} = -9$

22)  $\frac{x}{-9} + 2 = -1$

23)  $18 = -4w - 6$

24)  $-k + 5 = -8$

---

Write an equation and solve:

- 25) The cost of 6 dinners at a restaurant was \$150. How much does each person pay if they equally share the cost?

**Lesson 1: Homework** (Solve for the variable)

1)  $x - 6 = -6$

2)  $x + 11 = 3$

3)  $x + 14 = -8$

4)  $x - 5 = 0$

5)  $-43 = y - 5$

6)  $16 = 4x$

7)  $6x - 1 = 19$

8)  $2x + 12 = 18$

9)  $-8 = 4 + 12a$

10)  $\frac{x}{9} + 12 = 9$

11)  $\frac{x}{3} - 21 = -56$

12)  $77 = 10a + 7$

13)  $5a - 35 = 0$

14)  $4r + 13 = 41$

15)  $3x - 7 = -22$

16)  $5 - 3x = 17$

17) 4 posters cost \$7.40. If each poster costs the same, how much does each poster cost?

18) If you double your weight and add 6, your weight is 200 lbs. How much do you weight?

**Review Work:** Simplify each expression

19)  $4 + x - 12 + x$

20)  $-3x + 7x - 27$

21)  $5x - 7 - 5x$

22)  $-\frac{1}{8} + 3x - \frac{1}{8}$

## Evaluate each expression

23)  $-4x + 18$  when  $x = \frac{1}{4}$

24)  $3x - 18$  when  $x = -8$

25)  $7x^2 - 124.3$  when  $x = -5$



**Lesson 2**  
**Solving Equations with Like Terms**

---

**Vocabulary:**

**Like Terms** - \_\_\_\_\_

**Steps to Solving Equations with Like Terms**

1 - \_\_\_\_\_

2 - \_\_\_\_\_

---

**Examples:** (Solve for the variable)

1)  $2x + 5x = 28$

2)  $-12 + 5x - 6x = 9$

---

3)  $6x + 4 - 8x = -34$

4)  $4a + 9a - 6a = 42$

---

Write an equation and solve:

5) If you sell 3 bags of candy, then 4 bags and finally 1 bag, how much is each bag if you collected \$6.40?

**Try These:** (Solve for the variable)

1)  $12 + 3a - 14 = 1$

2)  $4x - x + 1 = 22$

3)  $7x - 5 + 3x = 15$

4)  $12 = 3c - 12 + 5c$

---

5) If 8 times a number is decreased by 3 times the same number the result is 35. Find the number.

---

**Lesson 2: Classwork** (Solve for the variable)

1)  $13a - 6a = 49$

2)  $y + 2y = 12$

3)  $9 - 4a + 4 = -3$

4)  $6y - 4y + y = 18$

---

5)  $13x - 7 - 5x = 9$

6)  $18 = 8y - 7 - 3y$

7)  $32 = -8x + 4 + 4x$

8)  $9m + 5 - 4m = 35$

---

**Write an equation and solve**

9) We rent 3 video games on Friday and 11 on Saturday. Each video game costs the same amount. If we spend \$8.40, how much was each game?

**Lesson 2: Homework** (Solve for the variable)

---

1)  $3a + 6a = 90$

2)  $3y - y + 4y = -36$

3)  $a - 10 + 2a = -4 + 2$

4)  $9 + 6a - 2a = 21$

---

5)  $8x + 7 - 5x = 31$

6)  $6 = -2 + 3w + 11$

7)  $5y + 2y - 9y = -84$

8)  $4r + r - 11 = 9$

---

9)  $2x - 6 + 3x = 29$

10)  $100x - 89x = 121$

11)  $x + 2 + 2 + 4x = 24$

12)  $7 - 5x + 1 - x = 2$

---

**Write an equation and solve**

13) Leo bought two pages for his album and Jackie bought three pages. If each page costs the same and together they spent \$15, how much did each page cost?

---

14) The formula for perimeter of a rectangle is  $P = 2l + 2w$ , where  $l$  is the length and  $w$  is the width. Evaluate the equation if the length of the rectangle is 8 and the width is 3.

---

15) Simplify the expression:  $34.6 - 2.5^2 + 14.78$

16) Convert  $160^\circ \text{C}$  to degrees Fahrenheit

**Lesson 3**  
**Solving Equations with Variables on Both Sides**

**Steps to Solving Equations with Variables on Both Sides**

1 - \_\_\_\_\_

2 - \_\_\_\_\_

\_\_\_\_\_

3 - \_\_\_\_\_

**Examples:** (Solve for the variable)

1)  $4x - 2 = x - 5$

2)  $2x - 6 = 14 - 3x$

3)  $18x + x = 5x - 7$

4)  $11 - a = -1 - 7a$

---

**Write an equation and solve:**

- 5) You have \$12.50 in a savings account. You deposit \$7.25 more each week. Your friend has \$32.50 in a savings account. She deposits \$5.25 more each week. In how many weeks will they have the same amount?

---

**Try These:**

1)  $-4y - 13 + 9y = -18 + 6y$

2)  $7x + 8 = 4x + 17$

---

3)  $8 + 12x = 10x + 14$

4)  $4y + 11 = -y + 7$

**Lesson 3: Classwork** (Solve for the variable)

1)  $4x + 17 = 7x + 8$

2)  $3x + 2 + 6x = -23 + 4x$

3)  $6x - 3 = 7x + 7 + 4x$

4)  $-5x = 4x - 27$

5)  $12 - n = 16 + 3n$

6)  $8k - 36 = -4k$

7)  $7k - 5 - 8k = 4 + k - 6$

8)  $8 - g = g + 5$

9)  $9x + 6 = 6x + 24$

10)  $14x + 9 = -1 + 12x$

11)  $x - 7 = 13 - 4x$

12)  $8x - 36 = -4x$

**Lesson 3: Homework** (Solve for the variable)

1)  $9y - 7 = 5y + 21$

2)  $-1 + 8n = 21 + 6n$

3)  $14x + 9 = -1 + 12x$

4)  $7k - 11 = 19 + 8k$

5)  $\frac{y}{3} - 13 = -11$

6)  $-19 + 8x = x - 40$

7)  $4 = 4x + 3x - 10$

8)  $8k - 36 = -4k$

9)  $8w = -32 + 4w$

10)  $3m + 12 = 7m - 16$

11)  $-7c - 17 = -15 - 10c$

12)  $8m - 3 = 5m - m$

---

13) Marcy made an error when solving the equation below.

$$8m - 20 = 36$$

$$8m - 20 + 20 = 36$$

$$8m = 36$$

$$\frac{8m}{8} = \frac{36}{8}$$

$$m = 4\frac{4}{8}$$

A) Identify Marcy's error to explain why it resulted in an incorrect solution.

---

---

---

B) Correctly solve  $8m - 20 = 36$  for  $m$ . Show your work.

---

14) Evaluate: If  $x = 2$  and  $y = -3$ :

$$-3xy - x + y^2$$

---

15) What value of  $x$  make the equation true?  $\frac{3}{4}x + 9 = 3$

A.  $x = -8$

B.  $x = \frac{-1}{2}$

C.  $x = 1$

D.  $x = 16$

**Lesson 4**  
**Solving Equations Using the Distributive Property**

**Vocabulary:**

**Distribute** - \_\_\_\_\_

**Distributive Property** - \_\_\_\_\_

**Steps to Solving Equations Using the Distributive Property**

1 - \_\_\_\_\_

2 - \_\_\_\_\_

3 - \_\_\_\_\_

**Examples:** (Solve for the variable)

---

1)  $2(x + 6) = 20$

2)  $3(5x + 10) = 90$

3)  $3(x - 5) = 2(2x + 1)$

4)  $2(x - 5) = -3(6x - 10)$

**Try These:** (Solve for the variable)

---

1)  $2x = 10(x - 4)$

2)  $5(x + 6) = 3x$

3)  $8(x - 1) = 4(x + 4)$

4)  $7(2a - 4) = 2(a + 4)$

**Lesson 4: Classwork** (Solve for the variable)

---

1)  $4(x - 2) = 20$

2)  $-5(x + 4) = 15$

3)  $2(6 + 2a) = 24$

4)  $7(3x - 4) = 14$

---

5)  $7(x + 1) = 9 + 5x$

6)  $4(y - 1) = 2y + 6$

7)  $3(x - 3) = x + 1$

8)  $2(4 + 6x) = 2(5x + 7)$

---

**Lesson 4: Homework** (Solve for the variable)

1)  $4(x - 1) = 20$

2)  $2(5 + x) = 22$

3)  $-5(x + 4) = 15$

4)  $5(a + 4) = 10$

---

5)  $-4(2m + 6) = 16$

6)  $3(2b + 3) = 27$

7)  $14 - a = 2(a + 4)$

8)  $2(3 - y) = 4y$



---

9)  $5(x - 3) = 2x + 3$

10)  $6(x - 1) = 3(x + 1)$

11)  $2(x + 3) = 3(x - 3)$

---

13) Which best describes the solution for this equation?  $0.5(4x + 3) = 5x - 2.5$

A.  $x = 0.75$

B.  $x = 1.\bar{3}$

C.  $x = 4$

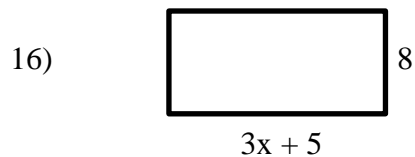
D.  $x = 12$

---

Convert the following temperatures:

14)  $80^\circ \text{C} = \underline{\hspace{2cm}} \text{F}$

15)  $145^\circ \text{F} = \underline{\hspace{2cm}} \text{C}$



If the area of the rectangle is 112, what is the value of  $x$ ?

**Lesson 5**  
**Solving Equations Multi-Step Equation**

**Steps to Solving Equations Using the Distributive Property**

- 1 - \_\_\_\_\_
- 2 - \_\_\_\_\_
- 3 - \_\_\_\_\_
- 4 - \_\_\_\_\_

**Examples: (Solve for the variable)**

1)  $2(x - 4) = 5x + 1 + 3x$

2)  $3(4x - 1) - 2 = 17x + 10$

**Try These: (Solve for the variable)**

1)  $3(x + 5) + 2x = 20 + 5$

2)  $4(x + 10) + 6x = 20 + 10$

3)  $5(x + 3) = 2x + x + 21$

**Lesson 5 Classwork: (Solve for the variable)**

---

1)  $2(3x + 4) = 3x + x + 20$

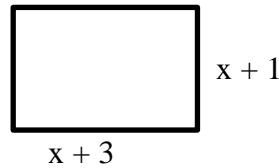
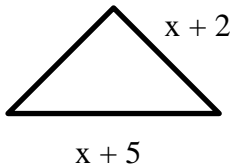
2)  $5(2x + 6) = 5x - 10$

3)  $2(3x - 6) = 16 - 8x$

---

4) Find the value of  $x$  so that each pair of polygons has the same perimeter.

$x + 4$



---

**Lesson 5 Homework:**

**Simplify:**

1)  $6x + x$

2)  $5x + 7 - 2$

3)  $6x + 2y - 4x + y$

4)  $3(x + 7)$

5)  $-5(2x + 4)$

---

6) Is 4 the solution to the equation  $-2n + 5 = -3$ ? Explain how you know.

---

---

---

- 7) Yolanda has \$38 in a bank account. She wants to make two equal deposits so that her account will have a balance of \$100. How much money does Yolanda need to deposit each time?
- A. \$19
  - B. \$31
  - C. \$38
  - D. \$62
- 

- 8) Sylvie's age is 5 years less than half Katie's age. If Sylvie is 11 years old, what is Katie's age?
- A. 8 years old
  - B. 12 years old
  - C. 27 years old
  - D. 32 years old
- 

- 9) What value of  $t$  make this equation true?  $6t - 8 = 2(2t + 1)$
- A.  $t = -3$
  - B.  $t = 1$
  - C.  $t = 2$
  - D.  $t = 5$
- 

**Solve for x:**

10)  $3x + 15 = 40 - 10$

11)  $\frac{x}{10} + 3 = 6 + 1$

12)  $x - 22 + 3x = 1 + 1$

13)  $-4(2x - 4) = 80$

---

14)  $6(x - 2) = 42$

15)  $3(2x + 4) = 5x + 17$

16)  $6x + 30 + x = 4x + 90$

17)  $-(x + 2) = 8$

## Lesson 6 Solving Special Solutions

**Vocabulary:**

**No Solution** - \_\_\_\_\_

**One Solution** - \_\_\_\_\_

**Infinite Solutions** - \_\_\_\_\_

Type of Solution	Description Word	Algebraic Form
No Solution	None	$a = b$
One Solution	One	$x = a$
Infinite Solutions	Many	$a = a$

**Examples:**

$2x - 4 = 2(x + 1)$ $2x - 4 = 2x + 2$ $\underline{-2x \quad -2x}$ $-4 = 2 \text{ (no solution)}$	$2x - 4 = -x - 1$ $\underline{+x \quad +x}$ $3x - 4 = -1$ $\underline{\quad +4 \quad +4}$ $\frac{3x}{3} = \frac{3}{3}$ $x = 1 \text{ (one solution)}$	$2x - 4 = 2(x - 2)$ $2x - 4 = 2x - 4$ $\underline{-2x \quad -2x}$ $-4 = -4 \text{ (infinite solutions)}$
--	---	--

**Examples:** (Solve for the variable and identify the type of solution)

1)  $5x + 8 = 5(x + 3)$

2)  $9x = 8 + 5x$

3)  $6x + 12 = 6x + 12$

4)  $7x - 11 = 17 - 7x$

5)  $4x + 8 = 4(x + 4)$

6)  $3x + 3 = 3(x + 1)$

**Try These:**

---

If you solved an equation and this was your answer, what should you write to answer the question correctly.

1)  $6 = 6$

2)  $x = 5$

3)  $7 = 3$

4)  $x = \frac{4}{0}$ 

---

5) Solve for the variable and identify the type of solution:  $4x + 2x + 9 = 6x - 5 - 4$

---

**Lesson 6 Classwork:** (Solve for the variable and identify the type of solution)

1)  $5x = 9 + 2x$

2)  $x + 9 = 7x + 9 - 6x$

3)  $22y = 11(3 + y)$ 

---

4)  $-3y + 1 = y + 9 - 4y$

5)  $16z - 24 = 8(2z - 3)$

6)  $-5w = 7 - 4w + 8$ 

---

**Lesson 6 Homework:** (Solve for the variable and identify the type of solution)

1)  $4r + 7 - r = 3(5 + r)$

2)  $4(x - 2) = -2x + 12 + 5x$

3)  $2x + 18 = (x + 9)^2$

4)  $2(5 + x) = 22$

5)  $6x + 11 - 4x = 10 + 2x + 1$

6)  $9y - 24 = 3(3y - 8)$

---

7)  $8 - 5x + 22 = -5(x - 6)$

8)  $-4(2m + 6) = 16$

9)  $14 - x + 12x = 32 + 11x$

---

10) Which best describes the solution for  $5b - 25 = 25$ ?

- a. no solution
- b. 0
- c. 10
- d. 80

11) Which best describes the solution for the

equation:  $6y - 3 = -6y + 3$

- a. no solution
- b. infinitely many solutions
- c. 0.5
- d. 2

---

**Review Work:**

12) Simplify the following:

$$4(-3) + 9 \div (-3) - 7$$

13) Using the formula:  $C = \frac{5}{9}(F - 32)$ ,

find C when F = 59 degrees.

---

14) Combine like terms:  $-3(x + 7) + 4x - 2y + 11 - 5y + x$

---

15) Which equation has no solution?

- a.  $3x - 4 = 4x - 3$
- b.  $x + 5 + 2x + 2x + 5$
- c.  $2(x + 2) - x = x + 2$
- d.  $6x + 1 - 6 = -5x + 6$

**Lesson 7**  
**Solving Decimal Equations**

---

**Examples:** (Solve for the variable)

1)  $0.2x + 0.3x = 25$

2)  $0.6x = 2.4$

3)  $0.4a + 0.7 = 55$

4)  $0.75y + 0.10y = 85$

---

5)  $0.7y = 4.2$

6)  $0.10x + 0.12x = 1.9$

7)  $0.03x = 0.15(4 - x)$

8)  $0.35x = 0.91 + 0.35$

---

9) A ball player's batting average is 0.330 this year. This is 1.2 times his average from last year. What was his average from last year?

---

**Try These:** (Solve for the variable)

1)  $0.4z + 0.8z = 3.6$

2)  $0.7 = 0.3 + 0.02a$

3)  $0.4a + 0.7 = 55$

4)  $0.7y + 0.1y = 16$

---

**Lesson 7 Classwork:** (Solve for the variable)

1)  $0.3n + 0.9n = 4.8$

2)  $0.21x + 3.6 = 3.6 + 0.21x$

3)  $5.5(2x - 3) = 10x$

4)  $0.2x = 0.2x + 23$



**Lesson 7 Homework:** (Solve for the variable)

---

1)  $0.6z + 3z = 3.6z$

2)  $0.7 = -0.3 - 0.01x$

3)  $0.4c + 0.7c = 55$

4)  $-0.9y - 0.4y = 65$

---

5)  $-0.12x = 45 - 0.12x$

6)  $2.1(15 + n) = 63$

7)  $4.2z + 1.5z = 57$

8)  $-0.5x - 2.1 = -0.1$

---

9)  $9 - x = 0.4(15 - 5x)$

10)  $0.22y = 1.54$

11)  $0.05x + 0.5x = 4.4$

12)  $0.4x = 26$

---

13) One suitcase is 5.8 kg less than another. Together the two suitcases are 37.6 kg. Find the weight of each suitcase.

---

14) If  $x = -2$  and  $y = -1$  evaluate  
 $-3x + 4y - xy$

15) Using the formula:  $C = \frac{5}{9}(F - 32)$ ,  
find C when  $F = 5$  degrees.

---

16) Trey went to the batting cages to practice hitting. He rented a helmet for \$4 and paid \$0.75 for each group of 20 pitches. If he spent a total of \$7 at the batting cages, how many groups of pitches did he pay for?

---

17) What is the sum of  $\frac{2}{5}$  and  $\frac{2}{7}$ ?

**Lesson 8**  
**Solving Fractional Equations**

**Steps for solving fractional equations**

- 1 - \_\_\_\_\_
- 2 - \_\_\_\_\_
- 3 - \_\_\_\_\_
- 4 - \_\_\_\_\_

**Examples:** (Solve for the variable)

1)  $\frac{4a}{2} - \frac{a}{2} = 6$

2)  $\frac{7x}{4} + \frac{2x}{4} = 18$

3)  $\frac{y}{2} - \frac{y}{4} = 5$

4)  $\frac{2m}{6} + \frac{1}{3} = 1$

5)  $\frac{x}{4} + 2 = \frac{x}{2}$

6)  $\frac{m}{3} + 2 = \frac{4}{3}$

7)  $\frac{2}{3}(12x-9)=26$

8)  $\frac{2}{3}(2x-4) = \frac{1}{2}x + 4$

9)  $\frac{5x-11}{4} = 21$

**Try These:** (Solve for the variable)

1)  $\frac{3x}{4} - \frac{x}{4} = -8$

2)  $\frac{x}{3} + \frac{6x}{3} = 14$

3)  $\frac{y}{3} - \frac{y}{5} = 4$

---

4)  $\frac{x}{6} - \frac{x}{6} = 0$

5)  $\frac{3}{9}x + \frac{1}{12} = \frac{x}{3}$

6)  $\frac{1}{3} + \frac{2n}{3} = 7$

---

**Lesson 8 Classwork/Homework:** (Solve for the variable)

1)  $\frac{x}{6} - \frac{7x}{6} = 4$

2)  $\frac{3x}{9} + \frac{2x}{9} = 5$

3)  $\frac{y}{6} + \frac{y}{3} = 6$

$$4) \frac{x}{5} - 4 = \frac{2}{10}x$$

$$5) \frac{2}{3} - \frac{1}{6} = \frac{x}{4}$$

$$6) \frac{3n}{2} + \frac{2n}{3} = 13$$

---

$$7) \frac{5x}{4} - 21 = -6$$

$$8) \frac{3x-1}{2} = -5$$

$$9) \frac{2}{5}(8x - 3) = x + 12$$

---

10) The perimeter of a rectangle is  $8(2x + 1)$  inches. If the length of the side of a rectangle is  $3x + 4$  inches and the width is  $4x + 3$  inches, what is the length of each side of the rectangle?

**Unit 2: Equations**

---

Solve the following equation for the missing variable, otherwise determine solution type.

1)  $5x - 3 = -8$

2)  $\frac{3}{8}x = 6$

3)  $\frac{4}{5}x - 3 = 9$

4)  $0.8 - 2x = 10$

5)  $7x - 2 + 5x = 10$

6)  $-15 + 4x = 3x + 5$

7)  $4x - 4 + 2x = 3x + 17$

8)  $-13x + 8 = -13x + 70$

9)  $-1.2 + 4x = 2x + 6.8$

10)  $\frac{4}{3}x - \frac{10}{3} = \frac{1}{2}x$

11)  $-0.1x + 0.4x = 15.3$

12)  $5(3x + 6) = -10x + 30$

13)  $\frac{3}{5} + \frac{1}{4}x = \frac{1}{2}$

14)  $2(9x + 3) = 6(3x + 1)$

15)  $-4(2x - 7) = 3x - (x + 12)$

**Translate each into an algebraic equation. (Do not solve)**

19) 8 more than a number is 12.

20) Ten is four times a number plus two.

21) The sum of five times a number and  
3 times the same number is 24

22) Seven less than twice a number is 18

23) Jackie wants to buy a TV for her mother that cost \$300. She plans to make a down payment of \$135. She will pay the rest of the cost in 6 equal payments. How much will each payment be?

Part A: Write an equation to solve: \_\_\_\_\_

Part B: Solve the equation:

**Unit 1: Review Work**

**Integer Rules:**

24)  $\frac{0}{7}$

25)  $\frac{7}{0}$

26)  $(-1)(5)(-3)$

27)  $(-3)3$

28)  $5 - (-6)$

29)  $(-0.27)(-0.6)$

30) Find the new temperature if it was 28 degrees at 1 pm and it dropped 30 degrees by 5 pm.

**Compare using > or < to make each sentence true.**

31)  $8 \underline{\hspace{1cm}} - 3$

32)  $-5 \underline{\hspace{1cm}} -2$

**Order of Operations**

Perform the indicated operations

33)  $13 - 14 + 7 - 3 + 2$

34)  $4(-3)^2 - 18$

35)  $\frac{-3.5(6.1-11.3)}{5-7}$

## Evaluating

Given the values the  $x = -2$ ,  $y = 3$ ,  $z = -1$  and  $k = 5$ , evaluate the following problems

36)  $x(y + z) + k$

37)  $\frac{ky^2 - x^3}{z}$

38)  $\frac{4}{3}(xyz)$

39)  $y^4 \div (k + x)$

---

40) The formula  $C = \frac{5}{9}(F-32)$  is used to find the Celsius temperature (C) for the given Fahrenheit temperature (F). What Celsius temperature is equal to  $104^\circ$  Fahrenheit?

---

## Combine Like Terms & Distributive Property

41)  $x + x$

42)  $-5x - 7x$

43)  $6x - 9y + 4x - y$

44)  $10x - 6x - 4x$

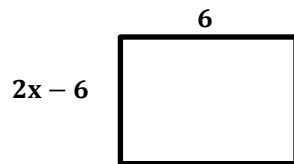
45)  $3(2x + 5) - 5$

46)  $-(5x - 8)$

47)  $25 - (-5x + 10)$

---

48) Determine the area of the rectangle.



---

49) The pentagon building in Washington D.C. is a regular pentagon. If the length of one side is represented by  $3n + 8$ , express the perimeter as a binomial.

---

50) Give an example of each:

Monomial \_\_\_\_\_ Binomial \_\_\_\_\_ Trinomial \_\_\_\_\_

# Unit 3

## Exponents

	Date	Lesson	Topic
		1	Introduction to Exponents
		2	Zero and Negative Exponents
		3	Multiplying Exponents
		4	Multiplying Exponents with Coefficients
			Quiz
		5	Distributive Property with Exponents
		6	Raising a Power to a Power
		7	Dividing Exponents
		8	Dividing Polynomials
			Review
			Test



## Lesson 1 Exponential Notation

### Vocabulary:

**Base** – When a number is raised to a power, the number that is used as a factor is the base.

**Exponential Form** – A number written with a base and an exponent.

**Expanded form** – A number written as the sum of the values of its digits.

**Compute** – Solve. Get an answer.

### Vocabulary: Review Questions

$$4x^2 + 7$$

- |                               |                            |
|-------------------------------|----------------------------|
| 1) Name the variable _____    | 4) Name the base _____     |
| 2) Name the coefficient _____ | 5) Name the constant _____ |
| 3) Name the exponent _____    |                            |

$$2^6$$

- |                               |
|-------------------------------|
| 1) What is the base _____     |
| 2) What is the exponent _____ |

### Part I: Exponential Notation

**Examples: Write the following in exponential form:**

1)  $5 \times 5 \times 5 \times 5 \times 5 \times 5$  \_\_\_\_\_

2)  $\frac{9}{7} \times \frac{9}{7} \times \frac{9}{7} \times \frac{9}{7}$  \_\_\_\_\_

3)  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 9 \cdot 9$  \_\_\_\_\_

4)  $4 \cdot 4 \cdot x \cdot x \cdot x$  \_\_\_\_\_

**Write in expanded form:**

5)  $6^3$  \_\_\_\_\_

6)  $(-2)^6$  \_\_\_\_\_

7)  $(-\frac{4}{11})^5 =$  \_\_\_\_\_

8) What do you think the value of  $n$  can be in  $x^n$

**Will these products be positive or negative? How do you know?**

9)  $(-1)^{12}$

10)  $(-1)^{13}$

## Understanding Exponents:

---

**Find the value of n:**

11)  $2^n = 16$

12)  $3^n = 27$

---

13) Rewrite 8 in exponential notation using 2 as the base.

---

14) Rewrite 81 in exponential notation using 3 as the base.

---

**Compute the value:**

15)  $2^4 =$  \_\_\_\_\_

16)  $-\left(\frac{1}{2}\right)^3 =$  \_\_\_\_\_

17)  $6^2 - 2^5 + 5^3 =$  \_\_\_\_\_

---

**Try These:**

**Write the following in exponential form:**

1)  $5 \cdot x \cdot x \cdot 5 \cdot x \cdot x$  \_\_\_\_\_

2)  $\frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}$  \_\_\_\_\_

3)  $y \cdot x \cdot y \cdot y \cdot x$  \_\_\_\_\_

---

**Write in expanded form and compute the value:**

4)  $\left(\frac{1}{2}\right)^4$  \_\_\_\_\_ = \_\_\_\_\_

**Find the value of n:**

5)  $2^n = 256$

---

6) Rewrite 125 in exponential notation using 5 as the base.

---

**Find the value of n:**

7)  $2^n = 32$

**Compute:**

8)  $2^3 + 3^2 =$  \_\_\_\_\_

9)  $4^2 - 2^4 + 5^1 =$  \_\_\_\_\_

## Lesson 1: Homework

---

Write the following in exponential form:

1)  $3 \cdot 3 \cdot 3$

2)  $5 \cdot 5 \cdot x \cdot x \cdot y \cdot y \cdot y$

3)  $\frac{3}{7} \cdot \frac{3}{7} \cdot \frac{3}{7} \cdot \frac{3}{7}$

---

Compute:

4)  $1^3 + 4^3$

5)  $2^2 - 4^1 + 2^3$

6)  $\left(\frac{1}{3}\right)^4$

---

Find the value of n:

7)  $3^n = 81$

8)  $4^n = 64$

9)  $5^n = 15,625$

---

10) A square has a length of 6.2 square feet.  
If the area of a square formula is  $A = s^2$ ,  
what is its area?

11) Find the value of x:  $0.4x - 2(0.5x + 9) = -3$

---

12) On our way to the "Polynomial Mall" we decide to pick up a few items. The only way to purchase the items is to simplify the cost of all the items you want. First a new skirt is perfect, the cost is  $7x^2 - 3$ . Next you see a great pair of boots which cost  $x^2 + 9x + 5$ . Around the corner you notice a nice belt for your dad. It is a bargain at  $6x - 1$ . After a long day a shopping, you decide to pick up a snack. The cost of the snack is  $x^2 - x$ . What is the grand total (simplified) of your polynomial shopping experience?

---

**Fill in the blanks about whether the number is positive or negative.**

13) If  $n$  is a positive even number, then  $(-55)^n$  is \_\_\_\_\_.

14) If  $n$  is a positive odd number, then  $(-72.4)^n$  is \_\_\_\_\_.

---

15) Write an exponential expression with  $(-1)$  as its base that will produce a positive product.

16) Write an exponential expression with  $(-1)$  as its base that will produce a negative product.

---

17) Rewrite each number in exponential notation using 2 as the base. (Example:  $2 = 2^1$ )

a)  $8 =$  \_\_\_\_\_

b)  $16 =$  \_\_\_\_\_

c)  $32 =$  \_\_\_\_\_

d)  $64 =$  \_\_\_\_\_

e)  $128 =$  \_\_\_\_\_

f)  $256 =$  \_\_\_\_\_

---

18) Tim wrote 16 as  $(-2)^4$ . Is he correct?

19) Could  $-2$  be used as a base to rewrite 32? Why or why not?

---

**Lesson 2**  
**Zero and Negative Exponents**

---

**Part 1: Zero Exponent**

**Rule:**

Any Number to the Zero Power equals \_\_\_\_\_

**Examples:**

1)  $5^0$  \_\_\_\_\_      2)  $x^0$  \_\_\_\_\_      3)  $5,928^0$  \_\_\_\_\_      4)  $(-2)^0$  \_\_\_\_\_

5)  $-2^0$  \_\_\_\_\_      6)  $(3x)^0$  \_\_\_\_\_      7)  $3x^0$  \_\_\_\_\_      8)  $3(xyz)^0$  \_\_\_\_\_

9)  $(x^4y)^0$  \_\_\_\_\_      10)  $8(x^2y^3)^0$  \_\_\_\_\_      11)  $4x(x^9y^5)^0$  \_\_\_\_\_

**Part 2: Negative Exponents**

**Definition:** For any positive number  $x$  and for any positive integer  $n$ , we define  $x^{-n} = \frac{1}{x^n}$ .

Note that this definition of negative exponents says  $x^{-1}$  is just the reciprocal  $\frac{1}{x}$  of  $x$ .

As a consequence of the definition, for a positive  $x$  and all integers  $b$ , we get  $x^{-b} = \frac{1}{x^b}$

**To convert the exponent from a negative to a positive**

**Rule:**

- 1) Write as a fraction if needed.
- 2) Write the reciprocal of the base.
- 3) Make the exponent positive.

**Examples: Write the following as a positive exponent:**

1)  $(4)^{-4}$  \_\_\_\_\_      2)  $\left(\frac{3}{4}\right)^{-1}$  \_\_\_\_\_      3)  $8^{-1}$  \_\_\_\_\_

4)  $\left(\frac{5}{6}\right)^{-2} =$  \_\_\_\_\_      5)  $\left(\frac{x}{y}\right)^{-5} =$  \_\_\_\_\_      6)  $x^{-9}$  \_\_\_\_\_

**To convert the exponent from a negative to a positive if both parts of the fraction have negative exponents**

**Rule:**

7)  $\frac{5^{-4}}{2^{-6}}$  \_\_\_\_\_      8)  $\frac{1^{-5}}{3^{-2}}$  \_\_\_\_\_      9)  $\frac{x^{-3}}{y^{-8}}$  \_\_\_\_\_

10)  $\frac{x^{-5}}{9^{-5}} =$  \_\_\_\_\_      11)  $\frac{14^{-6}}{1^{-7}} =$  \_\_\_\_\_      12)  $\frac{12^{-1}}{y^{-6}}$  \_\_\_\_\_

**Special Situations:**

**Rule:**

Move **only** the negative exponent to the opposite part of the fraction and then make the exponent positive.

13)  $\frac{5^4}{8^{-6}}$  \_\_\_\_\_      14)  $\frac{6^{-3}}{3^2}$  \_\_\_\_\_      15)  $\frac{3^{-9}}{5^2}$  \_\_\_\_\_      16)  $\frac{x^{-3}}{y^8}$  \_\_\_\_\_

17)  $\frac{x^5}{9^2}$  \_\_\_\_\_      18)  $\frac{4^{-4}}{3^{-7}}$  \_\_\_\_\_      \*19)  $\frac{2x^{-4}}{y^{-3}}$  \_\_\_\_\_      \*20)  $\frac{x^4}{6y^{-3}}$  \_\_\_\_\_

**Try These:**

**Simplify:**

1)  $-5^0$

2)  $4x^0$

3)  $(4x)^0$

4)  $3(ab)^0$

5)  $(-3)^0$

6)  $-3^0$

7)  $3x(y)^0$

8)  $(3xy)^0$

9)  $149x^0$

10)  $x(3a^3b^7c^4)^0$

**Write the following as a positive exponent:**

11)  $\left(\frac{1}{2}\right)^{-3}$

12)  $9^{-2}$

13)  $5^{-2}$

14)  $(x)^{-4}$

15)  $\frac{6^{-2}}{7^{-3}}$

16)  $\frac{x^{-4}}{y^6}$

17)  $\frac{7^3}{2^{-8}}$

18)  $\frac{(5x)^{-2}}{(2y)^{-5}}$

**Lesson 2: Classwork**

**Simplify and write as a positive exponent if needed**

1)  $3^0$

2)  $2x^0$

3)  $(2x)^0$

4)  $-8^0$

5)  $4(xy)^0$

6)  $4a(b)^0$

7)  $(-8)^0$

8)  $(4ab)^0$

9)  $\left(\frac{1}{8}\right)^{-2}$

10)  $\frac{6^{-5}}{2^{-3}}$

11)  $\frac{x^4}{9^{-3}}$

12)  $7^{-6}$

13)  $\frac{10^{-7}}{2^3}$

14)  $\left(\frac{13}{17}\right)^{-5}$

## Lesson 2: Homework

Simplify and write as a positive exponent if needed

1)  $(8x)^0$

2)  $8x^0$

3)  $9x(y^3)^0$

4)  $2(mn)^0$

5)  $\frac{0}{9}$

6)  $\frac{9}{0}$

7)  $5^{-3}$

8)  $\frac{1}{8^{-2}}$

9)  $\left(\frac{2}{3}\right)^{-4}$

10)  $\frac{4^{-3}}{7^{-2}}$

11)  $12^{-1}$

12)  $\frac{x^8y^{-3}}{ac^{-5}}$

Compute:

13)  $9^3$

14)  $5^0$

15)  $3^2 + \left(\frac{1}{9}\right)^0$

16)  $2^2 + 2^3 + 9^1$

17)  $5^2 - 3^3$

18)  $6^0 + 4$

19) Which is  $2(x^0)$  in standard form?

- A. 0      B. 1  
C. 2      D.  $2x$

20) Which shows  $9^{-3}$  in standard form?

- A. -729      B. -27  
C.  $\frac{1}{27}$       D.  $\frac{1}{729}$

21) Which is  $-7^0$  in standard form?

- A. -7      B. -1  
C. 0      D.  $\frac{1}{7}$

22) Which shows  $(-3)^2$  in standard form?

- A. 9      B. 6  
C.  $\frac{1}{9}$       D.  $\frac{1}{6}$

23) Which is  $5x(xy)^0$  in standard form?

- A. 5      B.  $5x$   
C. 1      D. 0

24) Which shows  $\left(\frac{2}{3}\right)^{-4}$  in standard form?

- A.  $\left(\frac{2}{3}\right)^4$       B.  $\left(\frac{2}{3}\right)$   
C.  $\left(\frac{3}{2}\right)^{-4}$       D.  $\left(\frac{3}{2}\right)^4$



### Lesson 3

## Multiplying Exponents

#### Vocabulary:

**Standard form** - The way you write any number normally.

**Rule: When multiplying exponents with the same base:**

1 - Keep the Base

2 - Add the exponents

**Examples:** Simplify and write in standard form

1)  $5^2 \cdot 5^3 =$  \_\_\_\_\_

2)  $7^3 \cdot 7^4 =$  \_\_\_\_\_

3)  $2^{10} \cdot 2^{16} =$  \_\_\_\_\_

**Examples:** Multiply using the laws of exponents. Rewrite as a positive exponent if necessary.

4)  $8^3 \cdot 8^5 =$  \_\_\_\_\_

5)  $3^4 \cdot 3^4 =$  \_\_\_\_\_

6)  $9^6 \cdot 9^{-3} =$  \_\_\_\_\_

7)  $\left(\frac{2}{5}\right)^3 \cdot \left(\frac{2}{5}\right)^{-7} =$  \_\_\_\_\_

8)  $6^5 \cdot 6^{-5} =$  \_\_\_\_\_

9)  $3^{-4} \cdot 3^{-5} \cdot 3 =$  \_\_\_\_\_

10)  $2^{-2} \cdot 2^7 \cdot 2^0 =$  \_\_\_\_\_

11)  $a^{-1} \cdot a^{-3} \cdot a =$  \_\_\_\_\_

12)  $x^2 \cdot x^5 =$  \_\_\_\_\_

13)  $7^2 \cdot 5^3 \cdot 7 =$  \_\_\_\_\_

14)  $2^2 \cdot 5^3 \cdot 7 =$  \_\_\_\_\_

\*15)  $2^3 \cdot 5^{-2} =$  \_\_\_\_\_

**Try These:** Multiply using the laws of exponents. Rewrite as a positive exponent if necessary.

1)  $2^9 \cdot 2^4 = \underline{\hspace{2cm}}$       2)  $4 \cdot 4^6 = \underline{\hspace{2cm}}$       3)  $5^{-5} \cdot 5^{-6} = \underline{\hspace{2cm}}$       \*4)  $9^2 \cdot 3^6 = \underline{\hspace{2cm}}$

5)  $\left(\frac{x}{y}\right)^{-4} \cdot \left(\frac{x}{y}\right)^1 = \underline{\hspace{2cm}}$       6)  $7^{-8} \cdot 7^8 \cdot 7 = \underline{\hspace{2cm}}$       7)  $y^4 \cdot y^{-9} = \underline{\hspace{2cm}}$       8)  $x^3 \cdot x^7 = \underline{\hspace{2cm}}$

9) Which is  $6^3 \times 6^4$  in standard form?

A)  $36^{12}$

C)  $7^6$

B)  $6^{12}$

D)  $6^7$

10) Which is equal to  $9^2$ ?

A)  $2^9$

C) 27

B)  $3^4$

D) 92

**Lesson 3: Classwork:** Multiply using the laws of exponents. Rewrite as a positive exponent if necessary

1)  $10^{13} \cdot 10^{-8} = \underline{\hspace{2cm}}$       2)  $2^{-2} \cdot 2 = \underline{\hspace{2cm}}$       3)  $1^{-3} \cdot 1^9 \cdot 1^4 = \underline{\hspace{2cm}}$       4)  $8^4 \cdot 8^{-4} = \underline{\hspace{2cm}}$

5)  $6^{-7} \cdot 6^2 \cdot 6^{-4} = \underline{\hspace{2cm}}$       6)  $\left(\frac{1}{2}\right)^6 \cdot \left(\frac{1}{2}\right)^2 = \underline{\hspace{2cm}}$       7)  $c^{-3} \cdot c^9 = \underline{\hspace{2cm}}$       8)  $x^2 \cdot x^4 \cdot x = \underline{\hspace{2cm}}$

9) Which is  $(-7)^2$  in standard form?

A) -7

C) 7

B) -49

D) 49

10) Which shows  $(-3)^2$  in standard form?

A) 9

C) -6

B) -9

D) 6

11) What is the value of  $3^4 \cdot 3^{-7}$ ?

A)  $3^{-3}$

C)  $3^3$

B)  $9^{-3}$

D)  $3^{11}$

12) The result of  $8^{-4}$  comes from which multiplication

A)  $8^3 \cdot 8^5$

C)  $3^4 \cdot 3^4$

B)  $8^3 \cdot 8^{-7}$

D)  $3^4 \cdot 3^{-8}$

### Lesson 3: Homework

Multiply using the laws of exponents. Rewrite as a positive exponent if necessary

1)  $2^2 \cdot 2^5$

2)  $3^8 \cdot 3^{11}$

3)  $4^4 \cdot 4$

4)  $6^{-3} \cdot 6^2$

5)  $3^7 \cdot 3^{-4}$

6)  $(-7) \cdot (-7)^9$

7)  $y^{-4} \cdot y^{-7}$

8)  $6^0 \cdot 6^4$

9)  $\left(\frac{1}{2}\right)^{-2} \cdot \left(\frac{1}{2}\right)^1$

10)  $x^4 \cdot x^{-4}$

11)  $3 \cdot 3^{-3} \cdot 3 \cdot 3^0$

12)  $\left(\frac{2}{3}\right)^{-5} \cdot \left(\frac{2}{3}\right)^9$

13)  $x^7 \cdot x^4$

14)  $7 \cdot 7$

15)  $(-9)^{-5} \cdot (-9)^6$

16)  $x^2 \cdot y^6$

17) Which is  $-2^3$  in standard form?

- A. 8
- C. 6

- B. -8
- D. -6

18) Which shows  $2^{-2} \times 2^6$  in exponential form?

- A.  $2^4$
- C.  $2^{-8}$

- B.  $2^{-4}$
- D.  $2^{-12}$

19) Amy wrote these expressions:

$6^3$

$3^5$

$10^2$

Part A: Write these expressions in order from least to greatest. \_\_\_\_\_

Part B: Explain how you know your answer is correct \_\_\_\_\_

20) Write in simplest form:

$4h - 7h + 9 - 2h + 6 + 3h - 1$

21) Which of the following equations has Infinitely Many Solutions?

(1)  $6x - 9 + 4x = 13 - x$

(2)  $x - 11 = -x + 2x - 1$

(3)  $9 - 3x = 3x - 6x + 10 - 1$

(4)  $3 = 7x - x + 21$

**Lesson 4**  
**Multiplying Exponents with Coefficients**

**Part 1: Multiplying Exponents with Coefficients**

**Rule:** If there is a coefficient and exponents:

1 – Multiply Coefficients

2- Add exponents of like bases

**Examples:** Multiply using the laws of exponents. Rewrite as a positive exponent if necessary

1)  $(5x^2)(3x^3)$

2)  $(-6ab^3)(-2a^2b^7)$

3)  $(3ab)(-5a^2bc^3)$

4)  $(2x^{-6}y^5)(-5x^2y^{-3})$

5)  $7x^2 \cdot 3y^6$

6)  $5c^{-3} \cdot 3c^9$

7)  $4x^2 \cdot 7x^4 \cdot x$

8)  $2x^2 \cdot 5x^7$

9)  $(7x^{-2})(-3x^{-3})$

**Try These:**

Multiply using the laws of exponents. Rewrite as a positive exponent if necessary

1)  $(a^5)(a^2)$

2)  $(m^8)(12m^4)$

3)  $(-8mp^5)(-m^2p)$

4)  $(2a^5)(7d^3)$

5)  $(6x^{-2}y^4)(-3x^3y^{-1})$

6)  $(4x^3y^5)(4x^3y^5)$

#### Lesson 4: Classwork/Homework

Multiply using the laws of exponents. Rewrite as a positive exponent if necessary

1)  $(4b^3)(8b^2)$

2)  $(16a^{10})(a^4)$

3)  $(7m^4)(m^3)$

4)  $(6c^3)(7c^5)$

5)  $(a^5)(7a^8)$

6)  $(4a^5)(8a^{-9})$

7)  $(9w^6)(5w^4)$

8)  $(x^5)(7x^7)$

9)  $(-4s^2)(7s)$

10)  $(6b^3)(-8b)$

11)  $(-4m^8)(7m)$

12)  $(-5t^6)(-t)$

13)  $(6a^3b^5)(8a^4b^6)$

14)  $(8a^4b^{-6})(2a^3b^2)$

15)  $(9m^2g^3)(-5m^5g^7)$

16)  $(-6ab^4)(-9a^4b^3)$

17)  $(-4p^4q^2)(7pq^5)$

18)  $(gh)(gh)$

19)  $(-x^4y)(-4x^5y)$

20)  $(-2m^7)(-3m^{-7})$

21)  $(-8a^5b^4)(-ab)$

22)  $(r^{-3})(9r)(-5r^4)$

23)  $(-8x^3)(-3x)(2x)$

24)  $(-7a^5)(-3a)(-3a)$

**Lesson 5**  
**Multiplying a Monomial by a Polynomial**  
**Distributive Property with Exponents**

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**Using the Distributive Property:**

Rule:

Step 1: Multiply Coefficients

Step 2: Add Exponents of like bases

**Examples:**

1)  $2(x + 8)$

2)  $4(6x - 7)$

3)  $-(4x^2 - 1)$

4)  $-7(2x^2 - 8)$

---

5)  $x(3x + 4)$

6)  $x(2x^2 - 9)$

7)  $-x^4(6x^3 - 8x^2)$

8)  $-x^5(7x^4 - 2x^3)$

---

9)  $4x^7(2x^5 - 3x^3 + 8x)$

10)  $5x^3(x^4 - 2x^3 + 3x)$

---

11)  $x^5y^2(2x^4 - 6xy + y^2)$

12)  $4x^2y^4(3x^5 - 2xy - 5y^2)$

---

\*13)  $(x + 8)(2x^2 + 5x + 3)$

**Try These:**

1)  $3(4x + 7)$

2)  $-3(5x^2 - 4)$

3)  $x^5(9x^2 + 5x)$

4)  $-2x^3(12x^6 + 7x^5 - 4x^4)$

**Lesson 5: Classwork/Homework**

Review: Multiplying a Monomial by a Monomial. Write as a positive exponent if necessary.

1)  $(x^6)(x^{-3})$

2)  $(5x^{-3})(3x^{-4})$

3)  $(9x^{-4}y^{-3})(4x^{-3}y^6)$

4)  $(2x^{-5}y^3)(3x^4y^{-8})$

**Multiplying a Monomial by a Polynomial**

5)  $-6(2x^2 + 3)$

6)  $x(x^2 - 7x)$

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

8)  $5x^2(4x^3 + 5x^2 + 10x)$

9)  $-3c^5(7c^3 - c^2)$

10)  $3h(5h^3 - 6h)$

11)  $2x(3x^3 - x^2 - 5)$

12)  $-2n(3n^2 - 3n - 7)$

13)  $w^2(5w^3 + 7w - 3)$

14)  $6a^3b^3(2a^5 - ab + 2b^4)$

\*15)  $(x + 2)(5x^2 + 3x + 8)$

**Lesson 6**  
**Raising a Power to a Power**

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**Vocabulary:**

**Power** - \_\_\_\_\_

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**Rule: When raising a monomial to a power:**

**Without a Coefficient**

- 1 - Rewrite in expanded form
- 2 - Keep the base
- 3 - Add the exponents

**With a Coefficient**

- 1 - Rewrite in expanded form
- 2 - Multiply the coefficients
- 3 - Add the exponents

**Examples:** Multiply using the laws of exponents. Write as a positive exponent if necessary

1)  $(2^8)^4 = \underline{\hspace{2cm}}$

2)  $(3^4)^2 = \underline{\hspace{2cm}}$

3)  $(10^9)^4 = \underline{\hspace{2cm}}$

4)  $(3^5)^3 = \underline{\hspace{2cm}}$

5)  $(6^{-2})^3 = \underline{\hspace{2cm}}$

6)  $(9^6)^{-2} = \underline{\hspace{2cm}}$

7)  $(6^2)^2 \cdot 6^{-5} = \underline{\hspace{2cm}}$

8)  $(2^7)^2 \cdot (2^{-1}) = \underline{\hspace{2cm}}$

9)  $(4^3)^2 \cdot (4^{-6}) = \underline{\hspace{2cm}}$

10)  $(-4x^8)^3 = \underline{\hspace{2cm}}$

11)  $-(3y^7)^4 = \underline{\hspace{2cm}}$

12)  $(2a^{11})^2 = \underline{\hspace{2cm}}$



$$13) (5x^3)^3 = \underline{\hspace{2cm}}$$

$$14) (-1m^4)^4 = \underline{\hspace{2cm}}$$

$$15) \left(\frac{1}{3}y^{-5}\right)^2 = \underline{\hspace{2cm}}$$

---

$$16) (2x^{-1})^3 = \underline{\hspace{2cm}}$$

$$17) (-2b^{-4})^4 = \underline{\hspace{2cm}}$$

$$18) (3x^4)^2 = \underline{\hspace{2cm}}$$

---

**Try These:**

Multiply using the laws of exponents. Write as a positive exponent if necessary

$$1) (2^9)^2$$

$$2) (4^2)^3$$

$$3) (5^{-5})^3$$

$$4) (3^3)^3$$

---

$$5) (7^0)^7$$

$$6) (2x^2)^3$$

$$7) -(-3y^5)^2$$

$$8) (x^4 \cdot x^2)^2$$

---

$$9) (-2x^{-2})^3$$

$$10) (6^{-2})^3 \cdot (6^{-5})$$

$$11) (2x^2)^3$$

$$12) 6x^3(5x^2 - 3x)$$

## Lesson 6: Classwork

Multiply using the laws of exponents. Write as a positive exponent if necessary.

1)  $(10^{-3})^2$

2)  $(3^{-2})^4$

3)  $(1^{-3})^4$

4)  $(8^{-3})^4$

5)  $(5^3 \cdot 5)^2 \cdot 5^{-7}$

6)  $9^{-2} \cdot 9^6$

7)  $-(-5a^7)^3$

8)  $(6y^3)^3$

9)  $(2x^{-1} \cdot x^3)^3$

10)  $(-b^{-4})^4$

11) Which is  $(2x^2)^1$  in standard form?

12) Which shows  $(3^2)^2$  in standard form?

A)  $2x^3$

C)  $4x^2$

A) 12

C) 81

B)  $2x^2$

D)  $4x^3$

B)  $\frac{1}{81}$

D)  $\frac{1}{12}$

13) Simplify:  $x(x + y)$

14) Simplify:  $(7)^2 \cdot (7)^2$

A)  $x^2 + y$

C)  $x^2 + xy$

A)  $7^2$

C)  $7^4$

B)  $2x^2y$

D)  $2x + xy$

B) 49

D)  $x^2 + 14x + 14$

## Lesson 6: Homework

Multiply using the laws of exponents. Write as a positive exponent if necessary

1)  $(x^4)^3$

2)  $(c^6)^7$

3)  $(p^5)^4$

4)  $(x^{-3})^8$

5)  $(m^4)^9$

6)  $(6x^3)^2$

7)  $(3g^2)^3$

8)  $(-2b^6)^3$

9)  $(-4t^5)^3$

10)  $(-y^4)^3$

11)  $(x^2y^4)^5$

12)  $(r^2y)^6$

13)  $(hk)^5$

14)  $(-fg^6)^7$

15)  $(-ay^4)^4$

16)  $(-2ab^4)^5$

17)  $(x^2yz^4)^3$

18)  $(-bc^6d^4)^3$

19)  $(-xy^3z^8)^4$

20)  $(-7a^3b^4c^5)^3$

21)  $(8^4)^3$

22)  $(2^{-1})^3$

23)  $(3^{-3})^4$

24)  $(7^{-2})^2$

25)  $(8^{-1})^2$

26)  $(3^7)^3 \cdot (3^{-2})^4$

27)  $(9^1)^6$

28)  $\left[\left(\frac{1}{2}\right)^3\right]^2$

---

29)  $(12^4)^4$

30)  $9^{-2} \cdot 9^6$

31)  $(y^{15})^2$

32)  $(3x^5)^4$

---

33)  $(3y^3 \cdot -2y)^3$

34)  $(5x^{-1})^2$

---

35) Which is  $(7^{-2})^{-1}$  in standard form?

A. -49

B. 14

C. -14

D. 49

36) Which shows  $(3x^{-2})^2$  in standard form?

A.  $-9x^4$

B.  $3x^{-4}$

C.  $3x^4$

D.  $9x^{-4}$

---

37) Frank wrote the expression  $9^{-2}$ .

Part A: What is the value (compute) of the expression? \_\_\_\_\_

Part B: Is the expression  $(-9)^2$  equivalent to  $9^{-2}$ ? Explain how you know. \_\_\_\_\_

\_\_\_\_\_

---

38) The formula for the volume of a rectangular prism is  $V = LWH$ . If the  $L = 8^4$  and  $W = 8^{-2}$  and the  $H = 8^0$ . What is the volume in exponential form?

39) In exponential form, what is the area of a square that has length of  $4^{-3}$  ?

**Lesson 7**  
**Laws of Exponents: Dividing**

**Vocabulary:**

**Quotient** – The answer to a division problem.

**Rule:** When dividing exponents with the same base:

1- Keep the base

2- Subtract the exponents

**Examples:**

Divide using the laws of exponents. Rewrite as a positive exponent if necessary.

1)  $\frac{5^8}{5^3} = \underline{\hspace{2cm}}$

2)  $\frac{6^3}{6^2} = \underline{\hspace{2cm}}$

3)  $2^5 \div 2^3 = \underline{\hspace{2cm}}$

4)  $\frac{5^7}{5^3} = \underline{\hspace{2cm}}$

5)  $\frac{9^5}{9^2} = \underline{\hspace{2cm}}$

6)  $\frac{7^3}{7^9} = \underline{\hspace{2cm}}$

7)  $\frac{x^{10}}{x} = \underline{\hspace{2cm}}$

8)  $\frac{4^{17}}{4^{16}} = \underline{\hspace{2cm}}$

9)  $\frac{y^{10}}{y^5} = \underline{\hspace{2cm}}$

10)  $\frac{x^3y^9}{y^9} = \underline{\hspace{2cm}}$

11)  $\frac{4^6 \cdot 5^2 \cdot (-1)^7}{4^5 \cdot (-1)^4} = \underline{\hspace{2cm}}$

**Rule:** If there is a coefficient and exponents:

1 - Divide the coefficients

2 - Subtract exponents of like bases

12)  $\frac{5x^3}{5x^2} = \underline{\hspace{2cm}}$

13)  $\frac{12x^5}{-6x^2} = \underline{\hspace{2cm}}$

14)  $\frac{14x^{11}}{21x^2} = \underline{\hspace{2cm}}$

15)  $\frac{-18x^9}{2x^{14}} = \underline{\hspace{2cm}}$

16)  $\frac{9a^6}{3a^2} = \underline{\hspace{2cm}}$

17)  $\frac{10x^5y^{12}}{20xy^8} = \underline{\hspace{2cm}}$

18)  $\frac{4x^{50}}{2y^{25}} = \underline{\hspace{2cm}}$

19)  $\frac{5x^4y}{x^{14}y^8} = \underline{\hspace{2cm}}$

**Try These:**

Divide using the laws of exponents. Rewrite as a positive exponent if necessary.

1)  $\frac{13^9}{13^3} = \underline{\hspace{2cm}}$

2)  $\frac{3^5}{3^{-4}} = \underline{\hspace{2cm}}$

3)  $\frac{2^4}{2^4} = \underline{\hspace{2cm}}$

4)  $\frac{y^6}{y^{11}} = \underline{\hspace{2cm}}$

5)  $x^8 \div x^4 = \underline{\hspace{2cm}}$

6)  $\frac{6^{-2}}{6^{-6}} = \underline{\hspace{2cm}}$

7)  $\frac{4w^3}{-2w} = \underline{\hspace{2cm}}$

8)  $\frac{x^{12} \cdot y^7 \cdot p^4}{x^4 \cdot y^7 \cdot p} = \underline{\hspace{2cm}}$

**Lesson 7: Classwork**

Divide using the laws of exponents. Rewrite as a positive exponent if necessary.

1)  $3^4 \div 3 = \underline{\hspace{2cm}}$

2)  $\frac{8^6}{8^4} = \underline{\hspace{2cm}}$

3)  $\frac{4^{12}}{4^7} = \underline{\hspace{2cm}}$

4)  $\frac{3^{11}}{3^{12}} = \underline{\hspace{2cm}}$

5)  $\frac{z^{23}}{z^{-7}} = \underline{\hspace{2cm}}$

6)  $\frac{x^3}{x^3} = \underline{\hspace{2cm}}$

7)  $\frac{4x^6}{16y^7} = \underline{\hspace{2cm}}$

8)  $30x^7 \div 5x^4 = \underline{\hspace{2cm}}$

9)  $\frac{-32x^8}{-16x^3} = \underline{\hspace{2cm}}$

10)  $\frac{7^4 \cdot 7^5 \cdot 3^4}{(7^3)^2 \cdot 3} = \underline{\hspace{2cm}}$

11)  $\frac{\left(\frac{1}{2}\right)^5}{\left(\frac{1}{2}\right)^3} = \underline{\hspace{2cm}}$

12)  $\frac{x^5 y^6}{x^{-5} y} = \underline{\hspace{2cm}}$

## Lesson 7: Homework

Divide using the laws of exponents. Rewrite as a positive exponent if necessary.

1)  $\frac{8^4}{8^2} = \underline{\hspace{2cm}}$

2)  $\frac{4^8}{4^3} = \underline{\hspace{2cm}}$

3)  $\frac{5^3}{5^9} = \underline{\hspace{2cm}}$

4)  $\frac{12^2}{12^2} = \underline{\hspace{2cm}}$

5)  $\frac{9^{11}}{9^9} = \underline{\hspace{2cm}}$

6)  $\frac{7^{10}}{7^{-9}} = \underline{\hspace{2cm}}$

7)  $\frac{10^{-4}}{10^{-9}} = \underline{\hspace{2cm}}$

8)  $\frac{4^6}{4^{13}} = \underline{\hspace{2cm}}$

9)  $\frac{x^3}{x} = \underline{\hspace{2cm}}$

10)  $\frac{m^{-2}}{m^{-3}} = \underline{\hspace{2cm}}$

11)  $\frac{x^4 y^7}{x^2 y^3} = \underline{\hspace{2cm}}$

12)  $\frac{w^{-4} y^{12}}{x^{-7} y^3} = \underline{\hspace{2cm}}$

13)  $\frac{6x^5}{3x^4} = \underline{\hspace{2cm}}$

14)  $\frac{5a^2}{10a^{-3}} = \underline{\hspace{2cm}}$

15)  $\frac{5^7 \cdot 6^{11} \cdot x^4}{5^3 \cdot 6^{-7} \cdot x} = \underline{\hspace{2cm}}$

16)  $\frac{(4^4 \cdot 4)^2 \cdot 3^2}{(4^2)^3 \cdot 3} = \underline{\hspace{2cm}}$

### Review Work:

Multiply using the laws of exponents. Rewrite as a positive exponent if necessary.

17)  $10^{-2} \cdot 10^{-1} = \underline{\hspace{2cm}}$

18)  $x^3 \cdot x^6 = \underline{\hspace{2cm}}$

19)  $2^6 \cdot 2^{-2} = \underline{\hspace{2cm}}$

20)  $(3^2 \cdot 3^5)^2 = \underline{\hspace{2cm}}$

21) What is the value of  $\left(\frac{3}{5}\right)^2$  in fraction form?  $\underline{\hspace{2cm}}$

22)  $\frac{\left(\frac{8}{5}\right)^9}{\left(\frac{8}{5}\right)^2} =$

23)  $\frac{(-5)^{16}}{(-5)^7} =$

24)  $\frac{\left(\frac{a}{b}\right)^9}{\left(\frac{a}{b}\right)^2} =$

25)  $\frac{13^5}{13^5}$

26) Determine the missing (?) value in each:

A)  $(5^?)^3 = 5^{12}$

B)  $\frac{2^8}{2^?} = 2^9$

C)  $(-2m^3n^4)^? = -8m^9n^{12}$

**Lesson 8**  
**Dividing Polynomial by a Monomial**

---

**To divide a polynomial by a monomial:**

1) Divide each term in the numerator by the monomial in the denominator.

**\* Remember: Division Rules:**

1) Divide coefficients

2) Subtract exponents

*Examples:*

1)  $x^{10} \div x^4$

2)  $\frac{-28a^9}{4a^3}$

3)  $\frac{16x^4}{8x^4}$

---

4)  $\frac{-24x^8y^{10}}{-36xy^5}$

5)  $\frac{32m - 20}{4}$

6)  $\frac{6x+2}{2}$

---

7)  $\frac{20n^4 - 15n^3 + 35n^2}{5n^2}$

8)  $\frac{15x^2 - 3x}{3x}$

---

9)  $(22x^8 - 18x^6 + 10x^3) \div 2x^3$

10)  $(5x^4 + 25x^3 - 10x^2) \div 5x$



**Try These:**

---

1)  $a^5 \div a^3$

2)  $-27x^9 \div -3x$

3)  $-40a^2 \div 5a^2$

4)  $(45m - 27) \div 9$

5)  $(30n^3 - 24n^2 + 18n) \div 6n$

---

**Lesson 8: Classwork/Homework:**

1)  $\frac{x^6}{x^2}$

2)  $x^4 \div x^{-3}$

3)  $\frac{15x^9}{5x^3}$

4)  $24x^{10} \div 8x^{-2}$

5)  $\frac{-18x^2}{6x^{-5}}$

6)  $\frac{30x + 20}{10}$

7)  $\frac{9x^3 - 12x^5 + 3x}{3x}$

8)  $\frac{6x^6 + 18x^4 - 6x^3}{6x^3}$

9)  $\frac{4x^9 - 8x^8 - 2x^7}{2x^3}$

---

## Review:

Let us summarize our main conclusions about exponents. For any numbers  $x$ ,  $y$  and any positive integers  $m$ ,  $n$ , the following holds:

1)  $x^m \cdot x^n = x^{m+n}$  Rule: \_\_\_\_\_

2)  $(x^m)^n = x^{mn}$  Rule: \_\_\_\_\_

3)  $(xy)^n = x^n y^n$  Rule: \_\_\_\_\_

And if we assume  $x > 0$  in equation (4) and  $y > 0$  in equation (5 and 7) below, then we also have:

4)  $\frac{x^m}{x^n} = x^{m-n}$ ,  $m > n$  Rule: \_\_\_\_\_

5)  $\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$  Rule: \_\_\_\_\_

6)  $x^0 = 1$  Rule: \_\_\_\_\_

7)  $\frac{x^{-2}}{y^{-3}} = \frac{y^3}{x^2}$  Rule: \_\_\_\_\_

## Extra Help: Using Exponent Rules:

**Remember:** When you multiply powers with the same base, you add the exponents.  
When you divide powers with the same base, you subtract the exponents.

### Write each answer with a positive exponent

1)  $x^5 \cdot x^9$

2)  $10^2 \cdot 10^3$

3)  $x^6 \cdot x^{-4}$

4)  $x^{-2} \cdot x^{-3}$

$$5) 10^{-3} \cdot 10^7$$

$$6) x^{-4} \cdot x$$

$$7) (x^5 y^3)(x^{-3} y^2)$$

$$8) (-2x^4 y^{-2})(5x^{-3} y^{-5})$$

$$9) x^8 \div x^2$$

$$10) x^4 \div x^6$$

$$11) x^8 \div x^{-2}$$

$$12) 10^{-2} \div 10^{-5}$$

**Write each answer with a positive exponent**

$$13) x^{-2} \cdot x^5$$

$$14) 6^{-6} \cdot 6^{-4}$$

$$15) x^{-6} \cdot x^6$$

$$16) x^{-7} \cdot x^9$$

$$17) (4x^8)(-3x^{-3})$$

$$18) (7x^{-5} y^{-3})(x^3 y^{-4})$$

$$19) x^9 \div x^6$$

$$20) x \div x^4$$

$$21) x^5 \div x^5$$

$$22) x^{-4} \div x^{-5}$$

$$23) 3^{-2} \div 3^{-2}$$

$$24) x^{500} \div x^{500}$$

$$25) (3x)^0$$

$$26) 3x^0$$

## Unit 3 – Exponents Study Guide

**\*\*Remember:**

$$3x^4$$

$x$  is the **base**. The base is what is being raised to a power.

$3$  is the **coefficient**. The coefficient is the number in front of the variable.

$4$  is the **exponent**. The exponent tells you how many times you multiply the base by itself.

### Zero Exponents

Anything raised to the zero power = 1.

$$x^0 = 1$$

$$5^0 = 1$$

$$3(x^0) = 3(1) = 3$$

$$(3x^0) = 1$$

### Negative Exponents

$$x^{-n} = \frac{1}{x^n}$$

If the exponent is negative, switch its position to make it a positive exponent

If it is in the numerator, move it to the denominator

If it is in the denominator, move it to the numerator

$$9^{-3} \cdot 4^2 = \frac{4^2}{9^3}$$

$$\frac{x^{-3}}{y^{-5}} = \frac{y^5}{x^3}$$

### Multiplying Exponents    MADS (Multiply – Add exponents)

#### Without a Coefficient

1. Keep like bases
2. Add the exponents of like bases

$$(6^5)(6^2) = 6^7$$

#### With a Coefficient

1. Multiply the coefficients
2. Keep like bases
3. Add the exponents of like bases

$$2x^4y^5 \cdot 4x^3y^8 = 8x^7y^{13}$$

**\*\* When Distributing, Multiply the term outside the parenthesis by each term in the parenthesis\*\***

$$\begin{aligned} 3x^4(5x^3 - 3x + 1) &= (3x^4)(5x^3) \quad (3x^4)(-3x) \quad (3x^4)(+1) \\ &= 15x^7 - 9x^5 + 3x^4 \end{aligned}$$

## Raising a Power to a Power MADS (Multiply – Add exponents)

### Without a Coefficient

- 1 - Rewrite in expanded form
- 2 - Keep the base
- 3 - Add the exponents

$$(6^5)^3 = (6^5)(6^5)(6^5) = 6^{15}$$

### With a Coefficient

- 1 - Rewrite in expanded form
- 2 - Multiply the coefficients
- 3 - Add the exponents

$$(2x^4)^2 = (2x^4)(2x^4) = 4x^8$$

## Dividing Exponents MADS (Division – Subtract Exponents)

### Without a Coefficient

3. Keep the base
4. Subtract the exponents

$$\frac{9^5}{9^3} = 9^2$$

### With a Coefficient

1. Divide the coefficients
2. Subtract the exponents

$$\frac{18x^8}{3x^3} = 6x^5$$

## Dividing Polynomials by Monomials

1. Divide each term in the numerator by the monomial in the denominator.

**\*Remember Division Rules:**

1. Divide Coefficients
2. Subtract Exponents

$$\frac{15x^7 - 9x^5 + 3x^4}{3x^4}$$

$$\begin{array}{|c|c|c|} \hline 15x^7 & -9x^5 & +3x^4 \\ \hline 3x^4 & 3x^4 & 3x^4 \\ \hline \end{array} = 5x^3 - 3x + 1$$

**Unit 3:**

1) Write in expanded form

a.  $5^3x^2$  \_\_\_\_\_

b.  $\left(\frac{3}{4}y\right)^4$  \_\_\_\_\_

2) Write the following in exponential form.

a.  $\frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3}$  \_\_\_\_\_

b.  $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot a \cdot a \cdot a$  \_\_\_\_\_

3) Write the following as **POSITIVE** exponents.

a.  $5^{-3}$  \_\_\_\_\_

b.  $\frac{x^{-1}}{9^{-5}}$  \_\_\_\_\_

c.  $\left(\frac{2}{3}\right)^{-2}$  \_\_\_\_\_

4) Compute the value (evaluate)

a.  $(-2)^4$  \_\_\_\_\_

b.  $\left(\frac{4}{5}\right)^{-2}$  \_\_\_\_\_

c.  $5^2 - 3^4 + 7^0$  \_\_\_\_\_

Will this product be positive or negative?

How do you know?

5)  $(-1)^{14}$  \_\_\_\_\_

6)  $(-1)^{283}$  \_\_\_\_\_

7) Find the value of n:

a.  $2^n = 64$  \_\_\_\_\_

b.  $3^n = 27$  \_\_\_\_\_

c.  $5^n = 125$  \_\_\_\_\_

8) Rewrite **8** in exponential notation using 2 as the base.9) Rewrite **81** in exponential notation using 3 as the base.10) Multiply. Exponents must be put **into positive exponential form**.

a.  $8^{-3} \cdot 8^7 =$  \_\_\_\_\_

b.  $4^4 \cdot 4^{-13} \cdot 4 =$  \_\_\_\_\_

c.  $3x^6 \cdot -6x^{19} =$  \_\_\_\_\_

d.  $3^{-5} \cdot 3^{-9} =$  \_\_\_\_\_

e.  $(6x)^0 =$  \_\_\_\_\_

e.  $6x^0 =$  \_\_\_\_\_

f.  $(x^4y)^0 =$  \_\_\_\_\_

g.  $6(x^3y^7)^0 =$  \_\_\_\_\_

11) Which is equal to  $8^{2^2}$ ?

- a)  $2^8$       b)  $2^6$
- c) 92      d) 82

12) Write  $(-7)^2$  in standard form.

\_\_\_\_\_

13) The result of  $5^{-4}$  comes from which multiplication?

- a)  $5^3 \cdot 5^2$       b)  $3^4 \cdot 3^4$
- c)  $5^3 \cdot 5^{-7}$       d)  $3^2 \cdot 3^{-6}$

Raising a Power to a Power: Multiply and put answers into positive exponential form.

14)  $(5^4)^3 =$  \_\_\_\_\_

15)  $(3x^{-2}y)^4 =$  \_\_\_\_\_

16)  $(5x^{-2}y)^3 =$  \_\_\_\_\_

17)  $(4x^8y^6)^{-2} =$  \_\_\_\_\_

18)  $(-2x^9)^2 =$  \_\_\_\_\_

19)  $(7^{-8})^2 \cdot 7^4 =$  \_\_\_\_\_

Distribute:

20)  $-(3x^2 - 4)$

21)  $3x(2x^2 + 5x)$

22)  $4x^2y^3(2x^6 - 3xy + 5y^4)$

---

Dividing exponents with the same base. Put answers in **positive exponential form**.

23)  $\frac{6^{14}}{6^5} = \underline{\hspace{2cm}}$

24)  $\frac{x^4}{x^7} = \underline{\hspace{2cm}}$

25)  $\frac{12y^{11}}{-4y^9} = \underline{\hspace{2cm}}$

26)  $\frac{9x^4y^8z}{3x^2y^8z^4} = \underline{\hspace{2cm}}$

27)  $3^5 \div 3^3 = \underline{\hspace{2cm}}$

28)  $8^7 \div 8^{13} = \underline{\hspace{2cm}}$

29)  $18x^7 \div 3x^3 = \underline{\hspace{2cm}}$

30)  $\frac{(-2)^5}{(-2)^5} = \underline{\hspace{2cm}}$

31)  $\frac{\left(\frac{2}{5}\right)^7}{\left(\frac{2}{5}\right)^2} = \underline{\hspace{2cm}}$

32)  $\frac{2^6 \cdot 3^2 \cdot (2)^7}{2^5 \cdot (2)^4} = \underline{\hspace{2cm}}$

33)  $\frac{3^7 \cdot 7^{11} \cdot y^4}{3^3 \cdot 7^{-7} \cdot y^4} = \underline{\hspace{2cm}}$

34)  $\frac{x^{10}}{x^{-6}} = \underline{\hspace{2cm}}$

35)  $\frac{12x^2 + 6x + 15}{3}$

36)  $\frac{20x^4 - 15x^2 + 5x}{5x}$

---

37) A square has a length of  $6x^2$ .

(a) Find the area of the square in exponential form.

(b) If  $x = 3$ , what is the area?

---

**Unit 1:**

38) Perform the indicated operations and evaluate

a.  $7^2 - (-2)^4$

b.  $\frac{1}{2} \div \frac{3}{4} + \frac{2}{3}$

39) Given  $a = -2$ ;  $b = 3$  and  $c = -1$ , evaluate the following.

$c(a + b)$

---

40) Distribute and/or Combine like terms

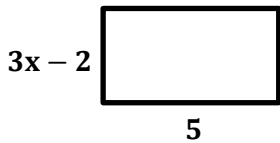
a.  $\frac{3}{5}(5x - \frac{2}{3})$

b.  $5x + 6 - 3x + 8$

c.  $5(2y - 11) - 6y$

d.  $4 - 2(4x + 3)$

41) The following figure contains a rectangle.



a. Determine the area of the rectangle.

b. If you put a fence **around** the rectangle how much fence would you need?

---

42) Using the equations to the right, determine the following:

$$C = \frac{5}{9}(F - 32)$$

$$F = \frac{9}{5}C + 32$$

a. If  $C = 10$ , find  $F$ .

b. If  $F = 68$ , find  $C$ .

---

**Unit 2:**

Solve the following equation for the missing variable, otherwise determine no solution or infinitely many solutions.

43)  $0.8 - 2x = 7.6$

44)  $\frac{4}{5}x - 3 = 9$

45)  $3x + 12 = 3(4 + x)$

46)  $-3(2x - 1) = 3x + x + 53$

47)  $6(2x - 8) = 12(x + 3)$

48)  $\frac{3}{5} + \frac{1}{4}x = \frac{1}{2}$



# Unit 4

## Graphing Lines

	Date	Lesson	Topic
		1	Write an Equation of a Line in Standard Form
		2	Make a Table
		3	Graph a Line Table Method
		4	Function Rule
		5	Finding slope and y-intercept from an equation
			Quiz
		6	Graph a Line slope/intercept method
		7	Graph a Line by both table and slope/y intercept method
		8	Graph Systems of Equations
			Review
			Test

**Lesson 1**  
**Write an Equation of a Line in Standard Form**

---

**Vocabulary:**

**Standard Linear Form** \_\_\_\_\_

**Standard form is also called -** \_\_\_\_\_  
\_\_\_\_\_

---

**Examples:**

Rewrite the equation in function form ( $y = mx + b$ )

1)  $3x + y = 8$

2)  $-x + y = 12$

3)  $4x - 2y = 8$

4)  $2x - y = 8$

---

5)  $4x = y + 8$

6)  $y - 3x = 0$

7)  $3x + 3y = 15$

8)  $3y - 2x = 27$

---

**Try These:**

Rewrite the equation in function form ( $y = mx + b$ )

1)  $5x + y = 16$

2)  $4x + y = -12$

3)  $-x + y = 6$

4)  $-2x + y = 15$

## Lesson 1: Classwork

---

Rewrite the equation in function form ( $y = mx + b$ )

1)  $5x - y = 10$

2)  $y - 7x = 0$

3)  $12x + 2y = 20$

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

---

5)  $-x + 2y = 8$

6)  $4x + y = 6$

7)  $-2x + 4y = -28$

8)  $-x + y = 15$

---

9)  $5x - y = 8$

10)  $y - 12 = 16$

11)  $3y - 2x = 9$

12)  $2(y - 3) = 10$

---

13)  $25 = 10x + 5y$

14)  $x = y - 4$

15)  $3y + 21 = 3x$

16)  $3x + 2 = y$

## Lesson 1: Homework

---

Rewrite the equation in function form ( $y = mx + b$ )

1)  $-x + y = 6$

2)  $x + y = -2$

3)  $-x + y = -2$

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

---

5)  $3x - y = 1$

6)  $-2x + y = 0$

7)  $4x + 2y = 8$

8)  $-9x + 3y = -6$

---

9)  $-2x + 3y = 3$

10)  $2x + y = 6$

11)  $x + 4y = -20$

12)  $-x + y = 7$

---

13)  $3x - y = -6$

14)  $y - 2 = 8$

15)  $3y - x = 12$

16)  $2(y - 4) = 8$

---

17)  $10x + 5y = 25$

18)  $y - 8 = x$

19)  $3y + 12 = 9x$

20)  $6x + 4 = y$

---

Review Work:

21) Hawaii's total shoreline is about  $2^{10}$  miles long. New Hampshire's shoreline is about  $2^7$  miles long. About how many times longer is Hawaii's shoreline than New Hampshire's?

---

22) Evaluate each expression for  $n = 3$

a.  $2n + 5 - n$

b.  $\frac{3n+18}{3n}$

c.  $\frac{24}{4-n} \cdot n$

**Lesson 2**  
**Make a Table**

**Vocabulary:**

**Equation of a Line** \_\_\_\_\_

**Rules:**

- 1) Solve for  $y$  ( $y = mx + b$ ) if needed
- 2) Pick values for the table
- 3) Solve for all  $y$  values
- 4) List the points of the line

**Examples:** Complete each table

1)  $y = x + 4$

x		y	(x,y)

2)  $y = x - 1$

x		y	(x,y)

3)  $y = 3x + 8$

x		y	(x,y)

4)  $y = -x + 3$

x		y	(x,y)

5)  $y = -2x - 1$

x		y	(x,y)

6)  $y = \frac{1}{3}x + 4$

x		y	(x,y)

**Try These:** Complete each table

1)  $y = \frac{1}{5}x$

x		y	(x,y)

2)  $2x + y = 3$

x		y	(x,y)

**Lesson 2: Classwork/Homework** Complete each table

1)  $y = 5x + 2$

x		y	(x,y)
-3			
1			
2			
4			

2)  $y = -3x + 7$

x		y	(x,y)
-5			
-2			
1			
3			

3)  $y = -6x + 9$

x		y	(x,y)
-1			
0			
1			
2			

4)  $y = 2x - 4$

x		y	(x,y)
-1			
0			
1			
2			

5)  $y = \frac{1}{2}x + 5$

x		y	(x,y)
-2			
0			
2			
4			

6)  $y = \frac{1}{4}x + 8$

x		y	(x,y)
-4			
0			
4			
8			

7)  $y = 2x + 3$

x		y	(x,y)
-1			
0			
1			
2			

8)  $y = -4x + 1$

x		y	(x,y)
-1			
0			
1			
2			

9)  $y = \frac{1}{2}x + 3$

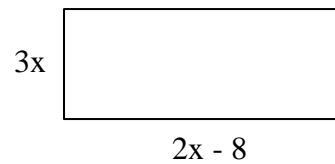
x		y	(x,y)

10)  $2x + y = 2$

x		y	(x,y)

Review Work:

11) Find the area of the rectangle.



12) Simplify:  $(3x - 5) - (x + 3) + (-2x + 7)$

13) Simplify:  $4\frac{2}{3} - (-3\frac{3}{4})$

14) Simplify:  $64 - 4^2 \div 8$

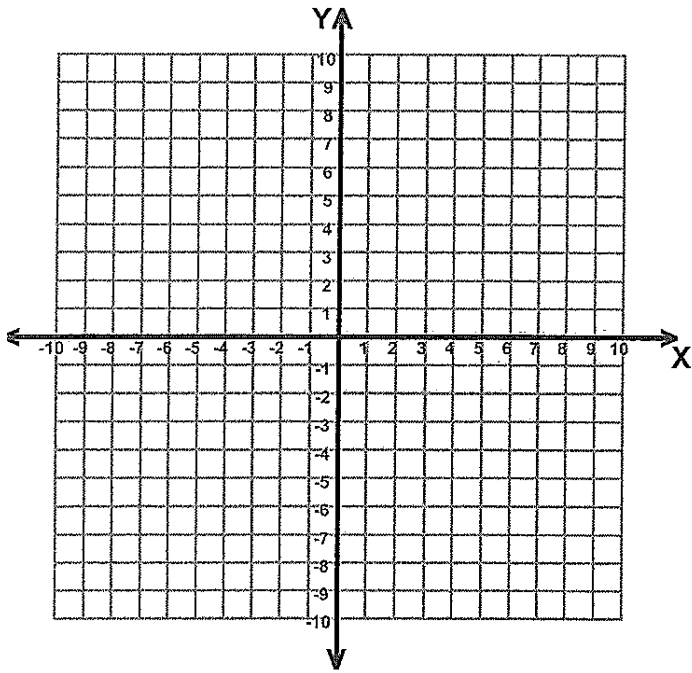
15) Solve for x:  $5x + 20 = 5(x + 4)$

Write as a positive exponent:

16)  $6^{-4}$

17)  $25x^4 \div 5x^8$

**“Things you should know”**

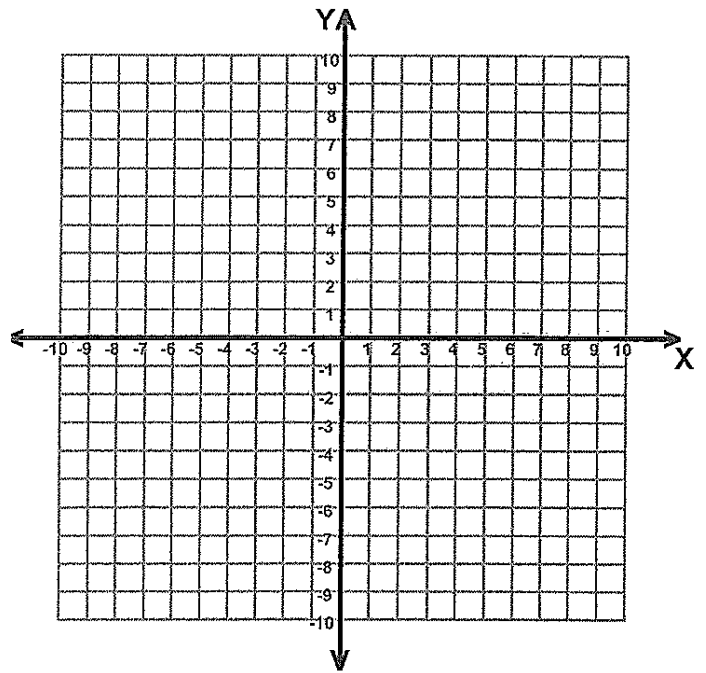
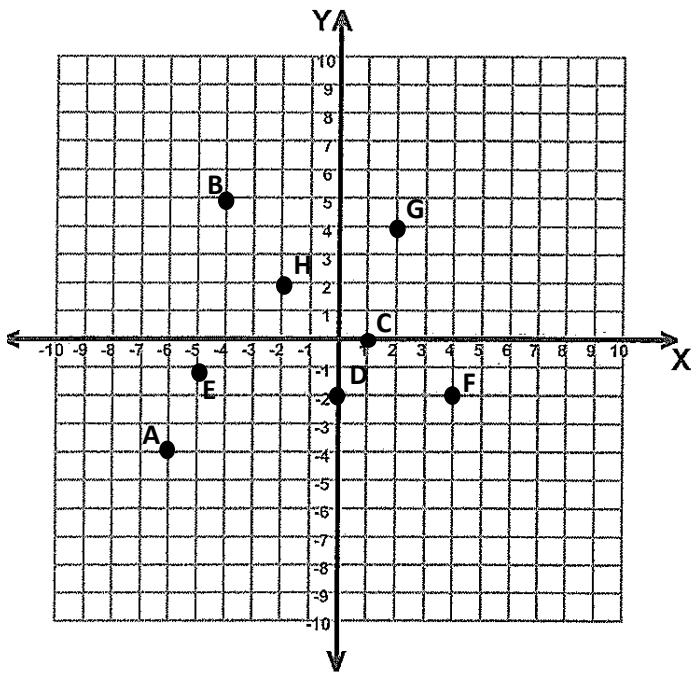


- 1) x axis
- 2) y axis
- 3) Origin (0,0)
- 4) Quadrants (I, II, III, IV)
- 5) A point is always written (x, y)
- 6) How to plot a point
- 7) How to name a point

**Examples:**

Give the quadrant or the axis of each point.

- |                   |                   |
|-------------------|-------------------|
| 1) (3, 1) _____   | 7) (-8, -4) _____ |
| 2) (-8, 2) _____  | 8) (0, -2) _____  |
| 3) (7, -4) _____  | 9) (-5, 5) _____  |
| 4) (-9, -2) _____ | 10) (6, 0) _____  |
| 5) (2, -9) _____  | 11) (2, 2) _____  |
| 6) (0, 0) _____   | 12) (1, -8) _____ |



Name each of the following points.

- |         |         |
|---------|---------|
| A _____ | E _____ |
| B _____ | F _____ |

Plot each of the following points and label.

- |           |          |
|-----------|----------|
| J (2, 3)  | N (8, 0) |
| K (-5, 1) | P (0,0)  |



### Lesson 3

#### Graph a Line Table Method

Rules:

- 1) Solve for y ( $y = mx + b$ ) if needed
- 2) Pick values for the table
- 3) Solve for all y values
- 4) List the points of the line
- 5) Graph and label the points
- 6) Connect the points with a ruler and put arrows on your line
- 7) Label the line

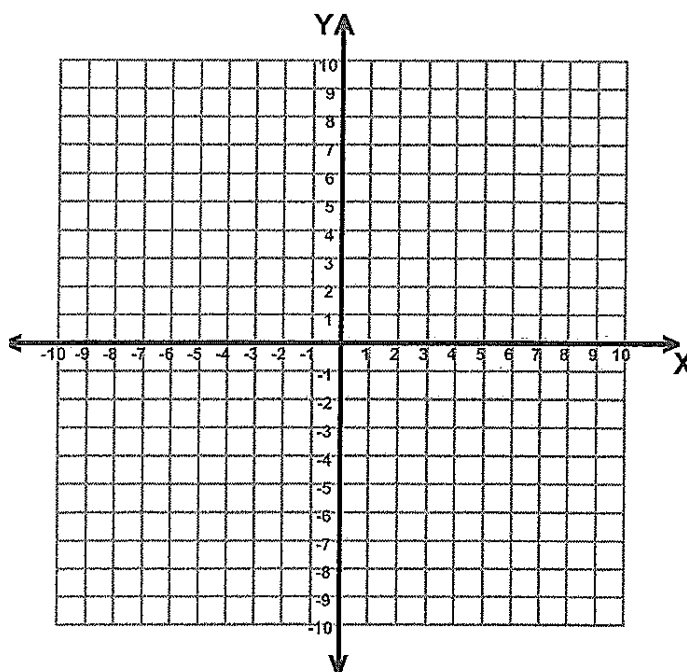
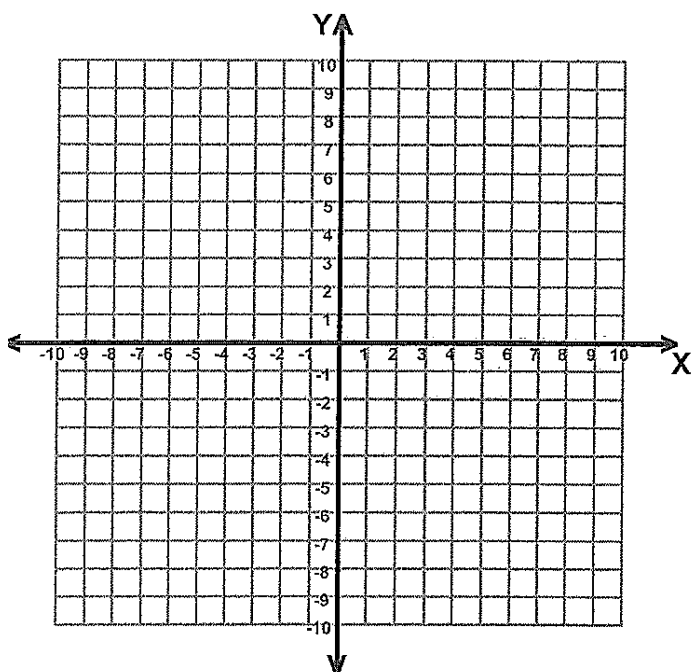
**Examples:** Complete the table and Graph the Line

1)  $y = 2x - 5$

x		y	(x,y)

2)  $y = \frac{1}{3}x + 2$

x		y	(x,y)

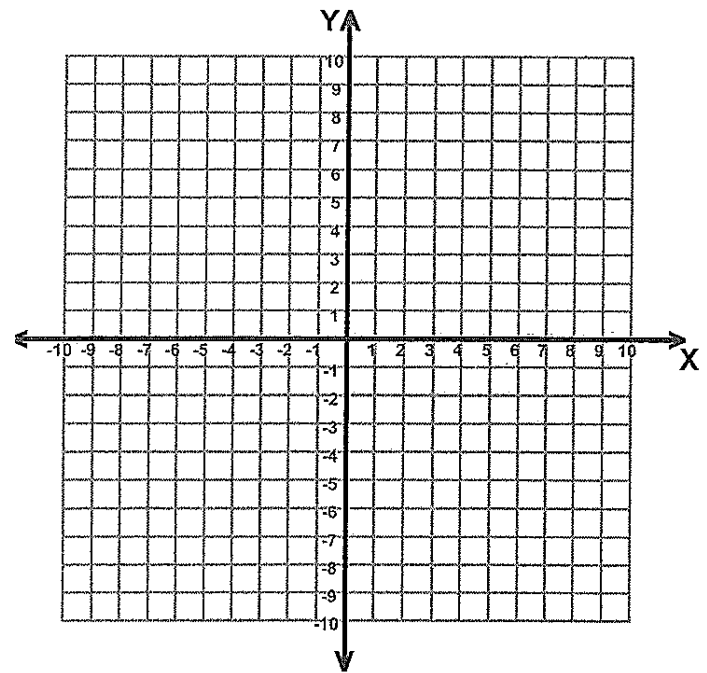
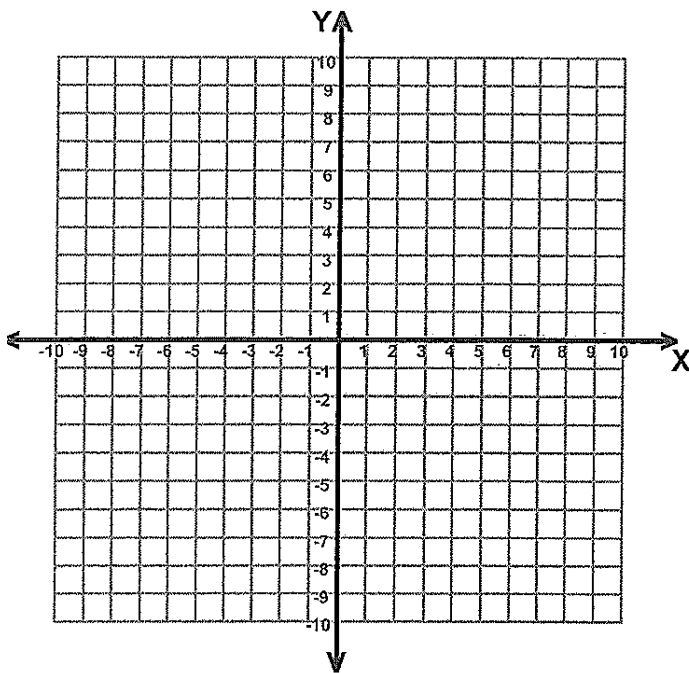


3)  $2x + y = 4$

4)  $4y + 2x = 16$

x		y	(x,y)

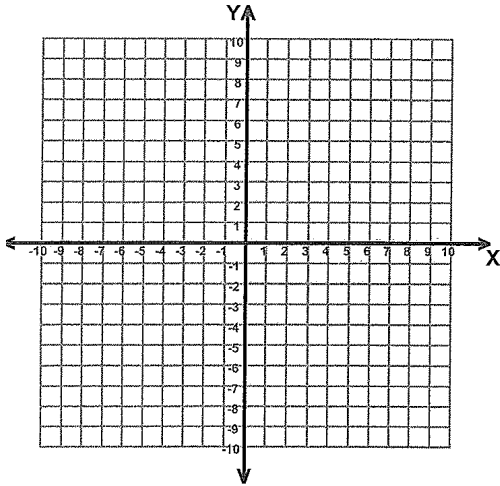
x		y	(x,y)



**Try These:** Complete the table and Graph the Line

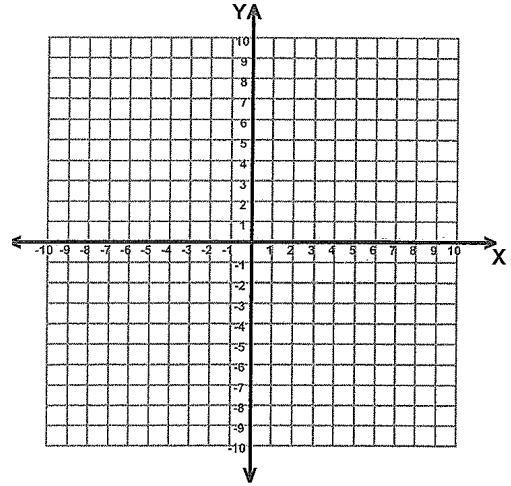
1)  $y = 3x - 4$

x		y	(x,y)



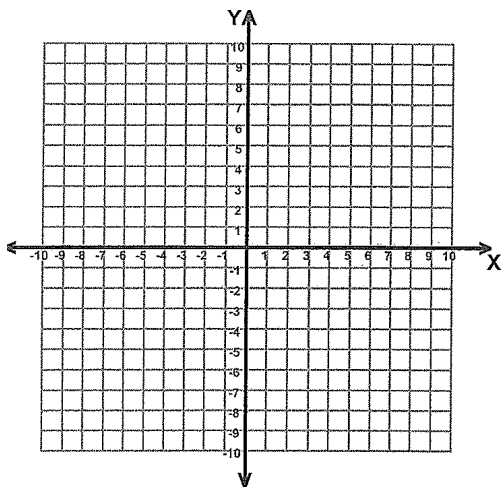
2)  $y = -x$

x		y	(x,y)



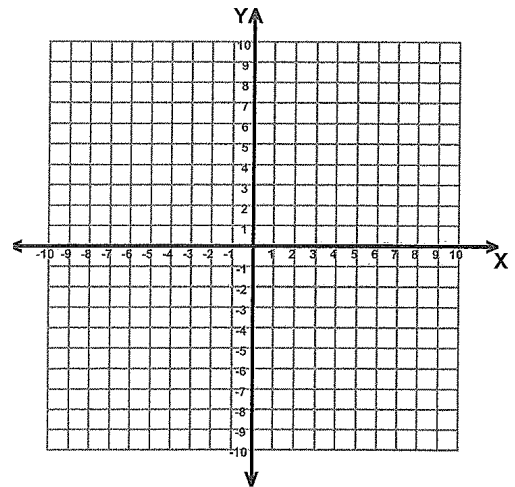
3)  $6 + y = 2x$

x		y	(x,y)



4)  $y = 5$

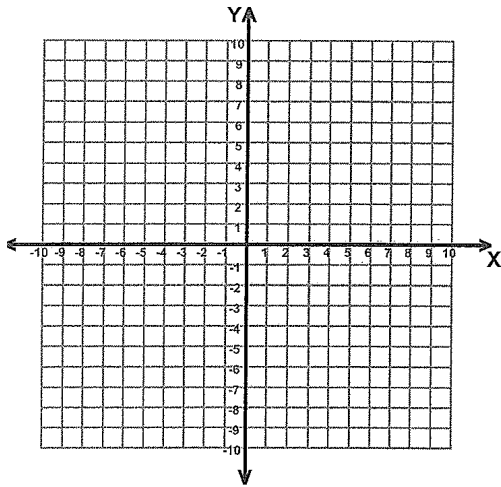
x		y	(x,y)



**Lesson 3: Classwork** Complete the table and Graph the Line

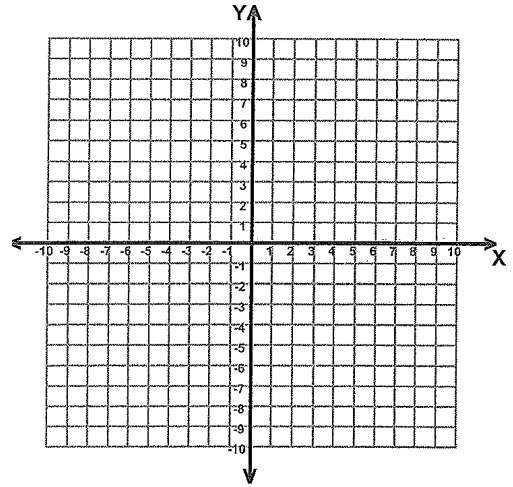
1)  $y = 2x + 2$

x		y	(x,y)



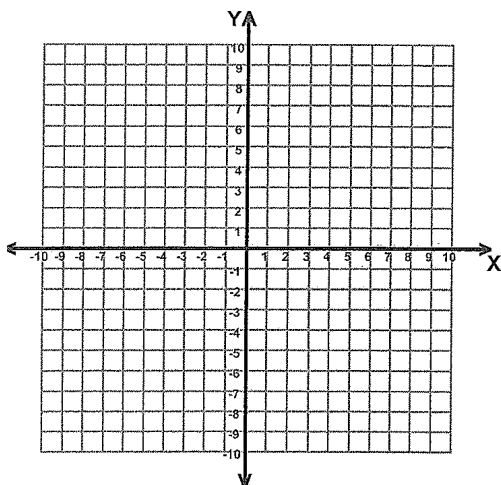
2)  $y = \frac{1}{2}x + 5$

x		y	(x,y)



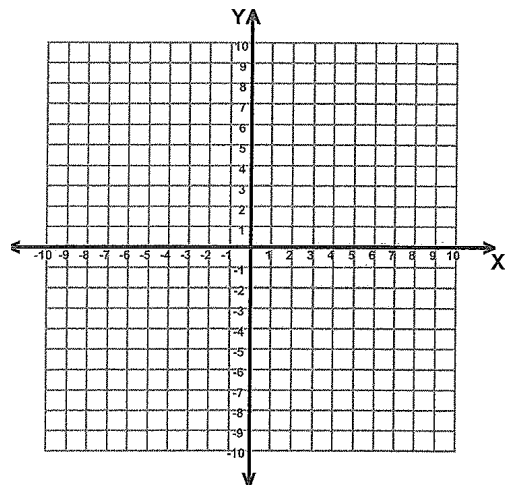
3)  $3x + y = 9$

x		y	(x,y)



4)  $2x - y = 4$

x		y	(x,y)



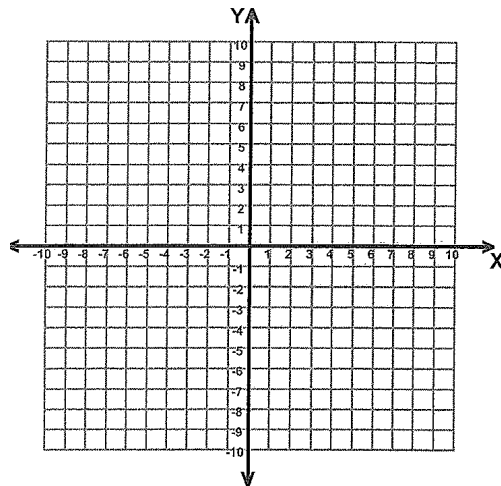
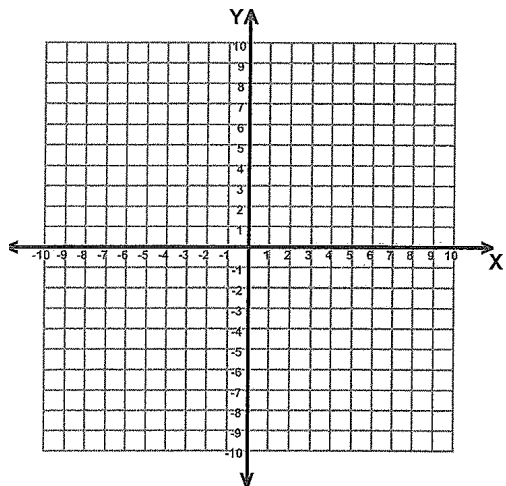
**Lesson 3: Homework** Complete the table and Graph the Line

1)  $y = 2x + 3$

x		y	(x,y)

2)  $y = -8$

x		y	(x,y)



Review Work:

3) Write  $x^{-6}$  as a positive exponent.

4) Solve for x:  $4(2x - 6) = 8(x - 3)$

Simplify:

5)  $\frac{8}{0}$

6)  $\frac{0}{9}$

7)  $x^{-2} \cdot x^8$

8)  $(2^2)^3$

9)  $5x^0$

10) Write  $3x + 5y = 15$  in y form

## Lesson 4 Function Rule

### Vocabulary:

Function Form \_\_\_\_\_

### Steps for writing a Table in Function Form

- 1 - Write  $y = \text{ \_\_\_ } x$
- 2 - Find the difference in the y values ( $\Delta y$ )
- 3 - Find the difference in the x values ( $\Delta x$ )
- 4 - Write it as a fraction:  $\frac{\Delta y}{\Delta x}$  and simplify
- 5 - Multiply first x value in the table by coefficient
- 6 - Find the number to add or subtract to equal the y value
- 7 - Check your answer with the next x value

### Examples:

Write the function rule for each table and fill in the missing number.

1)

x	y
1	4
2	8
3	12
4	16
5	20
10	

2)

x	y
3	2
5	6
7	10
9	14
11	18
21	

3)

m	c
5	5
6	6
7	7
8	8
9	9
25	

4)

x	y
6	23
8	24
10	25
12	26
14	27
15	

5)

x	10	11	12	13	14	15
y	15	17	19	21	23	

6)

x	2	4	6	8	10	50
y	8	12	16	20	24	

**Try These:** Write the function rule for each table and fill in the missing number.

1)

x	y
3	109
4	112
5	115
6	118
7	121
13	

2)

x	y
6	18
9	24
12	30
15	36
18	42
33	

3)

a	2	3	4	5	6	12
b	-2	-3	-4	-5	-6	

**Lesson 4: Classwork** Write the function rule for each table and fill in the missing number.

1)

x	y
1	11
2	18
3	25
4	32
5	39
9	

2)

x	y
3	7
5	9
7	11
9	13
11	15
40	

3)

x	y
-2	0
1	6
4	12
7	18
10	24
19	

4)

x	y
1	108
2	208
3	308
4	408
5	508
25	

5)

x	y
4	82
9	72
14	62
19	52
24	42
39	

6)

x	y
2	6
5	0
8	-6
11	-12
14	-18
20	

7)

x	y
1	26
5	18
9	10
13	2
17	-6
42	

8)

x	y
3	48
4	50
5	52
6	54
7	56
100	

9)

x	y
2	6
4	11
6	16
8	21
10	26
22	

10)

x	y
5	15
6	18
7	21
8	24
9	27
20	

11)

x	y
4	11
8	19
12	27
16	35
20	43
40	

12)

x	y
-10	9
-11	7
-12	5
-13	3
-14	1
5	

13)

x	y
5	6
15	26
25	46
35	66
45	86
-5	

14)

x	y
9	-5
6	-3
3	-1
0	1
-3	3
18	

15)

x	y
0	4
4	16
6	22
10	34
18	58
1	

16)

x	y
2	0
4	6
6	12
8	18
10	24
9	

17)

x	y
-8	9
-3	14
2	19
7	24
12	29
5	

18)

x	y
11	2
12	1
13	0
14	-1
15	-2
2	

19)

x	y
2	1
5	10
8	19
11	28
14	37
23	

20)

x	y
2	9
0	13
-2	17
-4	21
-6	25
12	

21)

x	y
5	13
6	10
7	7
8	4
9	1
0	

22)

a	4	5	6	7	8	20
b	1	3	5	7	9	

23)

x	0	1	2	3	4	5
y	0	1	2	3	4	

24)

a	-4	0	4	8	12	16
b	1	2	3	4	5	



**Lesson 4: Homework** Write the function rule for each table and fill in the missing number.

1)

x	y
1	3
2	6
3	9
4	12
5	15
10	

2)

x	y
7	5
5	11
3	17
1	23
-1	29
-9	

3)

x	y
1	9
2	12
3	15
4	18
5	21
14	

4)

x	y
0	9
2	21
4	33
6	45
8	57
25	

5)

x	y
-1	-1
1	3
3	7
5	11
7	15
18	

6)

x	y
4	5
6	8
8	11
10	14
12	17
40	

7)

x	y
-4	0
-2	1
0	2
2	3
4	4
100	

8)

x	y
1	8
2	10
3	12
4	14
5	16
22	

9)

x	y
0	0
1	20
2	40
3	60
4	80
37	

10)

x	y
0	2
2	8
4	14
6	20
8	26
10	

11)

x	y
1	3.5
2	4
3	4.5
4	5
5	5.5
10	

12)

x	y
2	13
4	23
6	33
8	43
10	53
20	

13)

x	4	5	6	7	8	20
y	1	3	5	7	9	

14)

x	0	-1	-2	-3	-4	8
y	0	1	2	3	4	

15)

a	-1	0	1	2	3	9
b	1	2	3	4	5	

**Lesson 5**  
**Finding slope and y-intercept from an equation**

**Vocabulary:**

Slope - \_\_\_\_\_

y-intercept - \_\_\_\_\_

**Rule:**

1 – Write the equation in function form

2 – Find m and b (write m =     and b = )

**Examples:** Rewrite the equation in function form ( $y = mx + b$ ) and then find m and b

1)  $y = 3x + 8$

m = \_\_\_\_\_

b = \_\_\_\_\_

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

m = \_\_\_\_\_

b = \_\_\_\_\_

3)  $y = -2x$

m = \_\_\_\_\_

b = \_\_\_\_\_

4)  $y = -4x - 7$

m = \_\_\_\_\_

b = \_\_\_\_\_

5)  $2x + y = 11$

m = \_\_\_\_\_

b = \_\_\_\_\_

6)  $-x + y = 6$

m = \_\_\_\_\_

b = \_\_\_\_\_

7)  $6x - 3y = 15$

m = \_\_\_\_\_

b = \_\_\_\_\_

8)  $5x - y = 1$

m = \_\_\_\_\_

b = \_\_\_\_\_

9)  $4x = y + 8$

m = \_\_\_\_\_

b = \_\_\_\_\_

10)  $y - x = 0$

m = \_\_\_\_\_

b = \_\_\_\_\_

11)  $6x + 6y = 36$

m = \_\_\_\_\_

b = \_\_\_\_\_

12)  $2y - x = 8$

m = \_\_\_\_\_

b = \_\_\_\_\_

## Lesson 5: Classwork

Rewrite the equation in function form ( $y = mx + b$ ) and then find  $m$  and  $b$

1)  $y = -x + 6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

2)  $y = x - 2$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

3)  $-x + y = -2$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

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

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

5)  $3x - y = 1$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

6)  $-2x + y = 0$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

7)  $4x + 2y = 8$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

8)  $-9x + 3y = -6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

9)  $-2x + 3y = 3$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

10)  $2x + y = 6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

11)  $x + 4y = -20$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

12)  $-x + y = 7$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

13)  $3x - y = -6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

14)  $y - 2 = 8$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

15)  $3y - x = 12$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

16)  $2(y - 4) = 8$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

17)  $10x + 5y = 25$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

18)  $y - 8 = x$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

19)  $3y + 12 = 9x$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

20)  $6x + 4 = y$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

## Lesson 5: Homework

Rewrite the equation in function form ( $y = mx + b$ ) and then find  $m$  and  $b$

1)  $5x + y = 16$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

2)  $4x + y = -12$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

3)  $-x + y = 6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

4)  $-2x + y = 15$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

5)  $5x - y = 10$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

6)  $y - 7x = 0$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

7)  $12x + 2y = 20$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

8)  $-15x + 3y = -3$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

9)  $-x + 2y = 8$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

10)  $4x + y = 6$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

11)  $-2x + 4y = -28$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

12)  $-x + y = 15$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

13)  $5x - y = 8$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

14)  $y - 12 = 16$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

15)  $3y - 2x = 9$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

16)  $2(y - 3) = 10$

$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

### Review Work:

17) Solve for  $x$ :  $-1.2 + 4x = 2x + 6.8$

Simplify:

18)  $13 - 15 + 8 - 1 + 4$

19)  $3(-4)^2 - 12$

20)  $(1.03 \times 10^9) \times (4.7 \times 10^7)$

**Lesson 6**  
**Graph a Line Slope/y-intercept Method**

**Rules:**

- 1) Solve for  $y$  ( $y = mx + b$ ) if needed
- 2)  $m =$      $b =$
- 3) Graph  $b$  on the  $y$  line
- 4) Make three more points using  $m$
- 5) Connect the points with a ruler and put arrows on your line
- 6) Label the line

**Remember:**

Always write the slope ( $m$ )  
as a **fraction!!!**

**Examples:**

Graph the following using slope/y-intercept

1)  $y = 2x - 3$

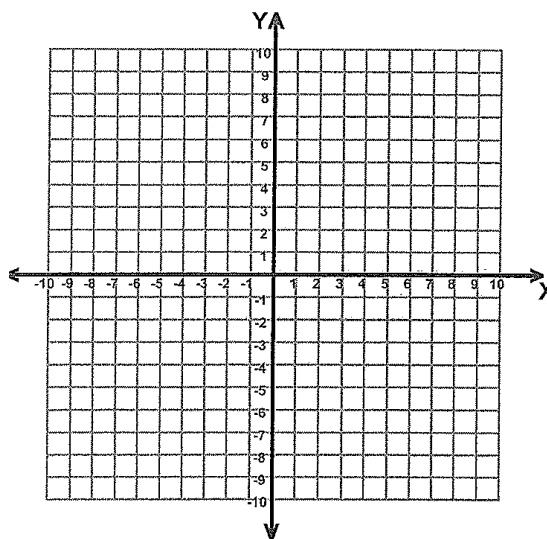
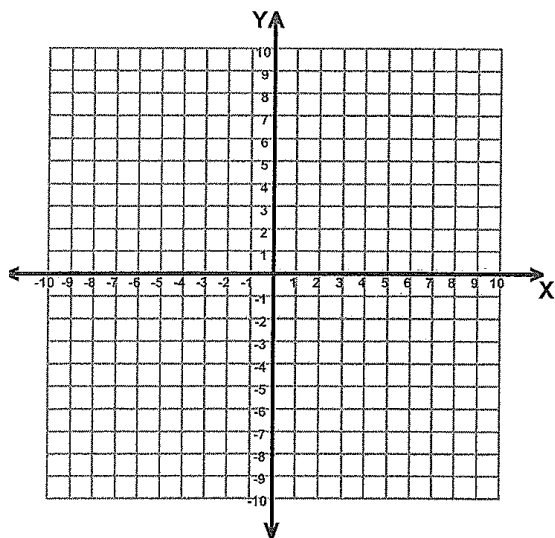
$m =$

$b =$

2)  $y = -2x + 4$

$m =$

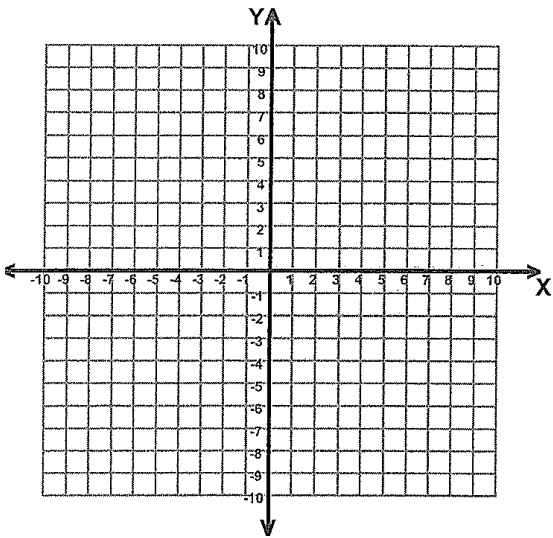
$b =$



3)  $y = x + 2$

m =

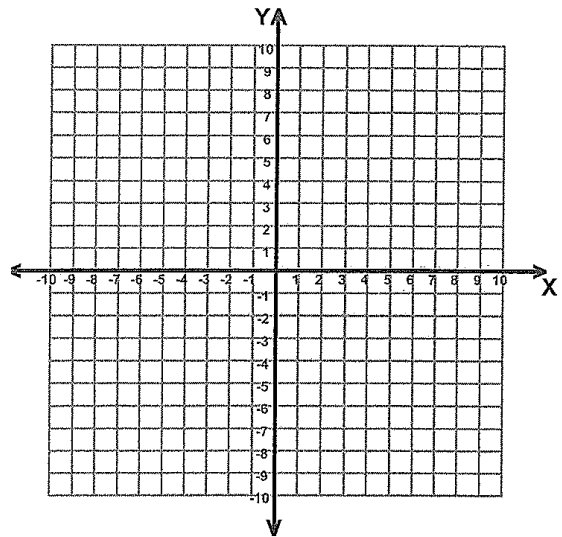
b =



4)  $y = -x + 1$

m =

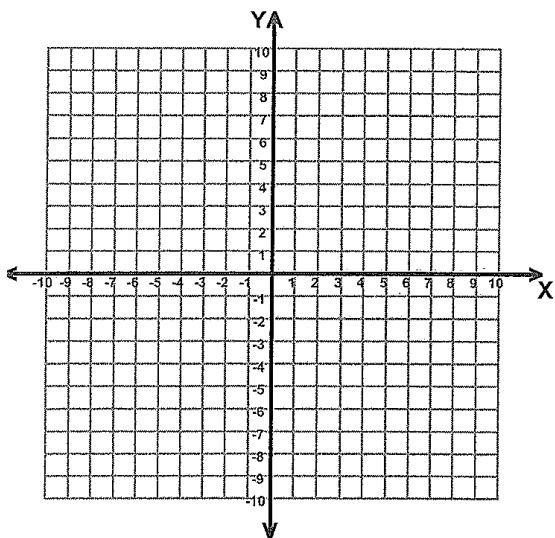
b =



5)  $y = \frac{1}{2}x - 5$

m =

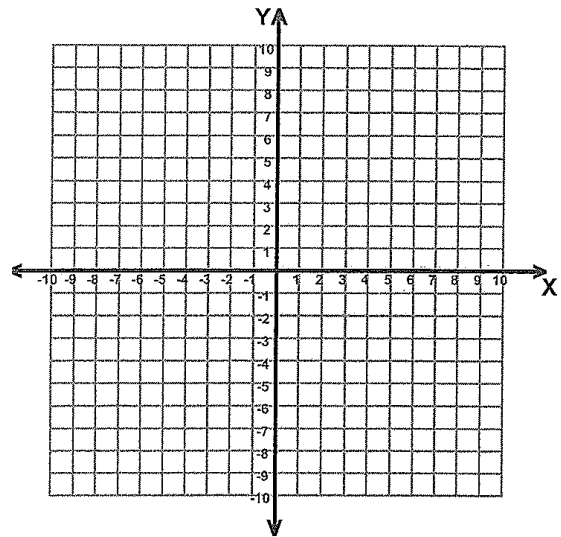
b =



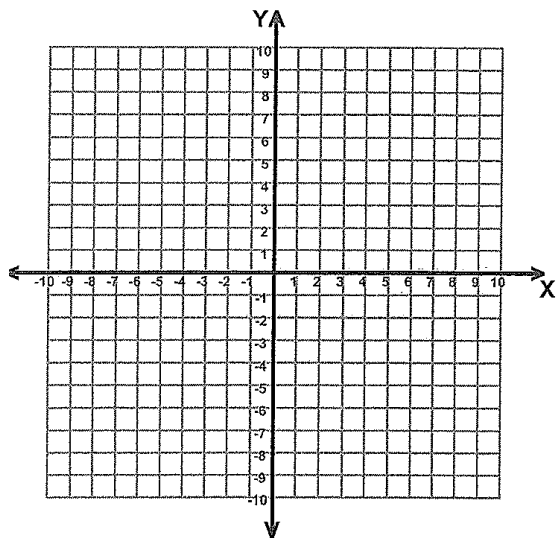
6)  $y = \frac{-2}{3}x + 8$

m =

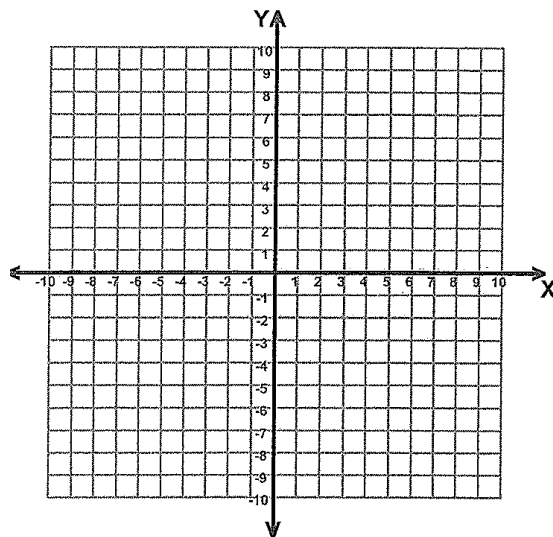
b =



7)  $y = 7$



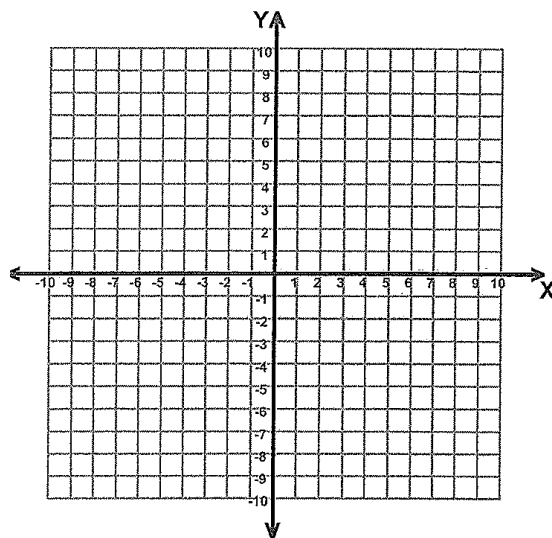
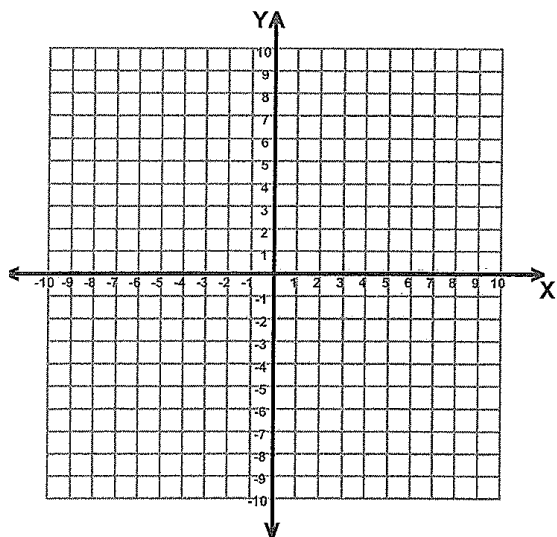
8)  $x = 9$



**Try These:** Graph the following using slope/y-intercept

1)  $y - 5 = -2x$

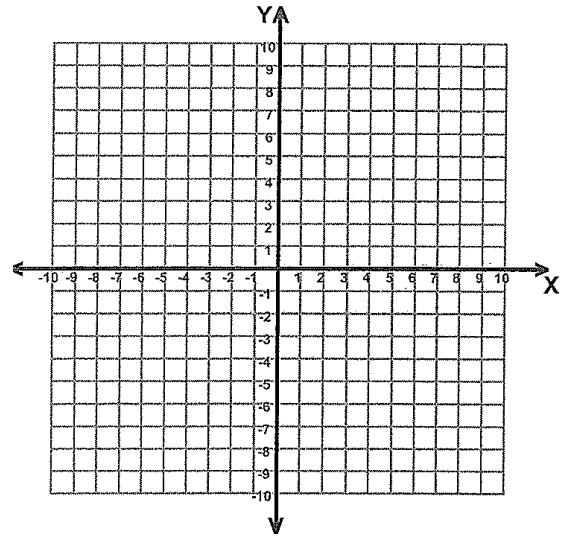
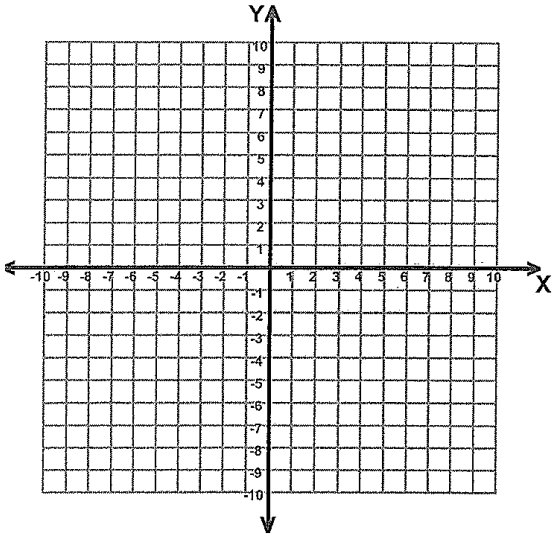
2)  $y = 3x$



**Lesson 6: Classwork/Homework** Graph the following using slope/y-intercept

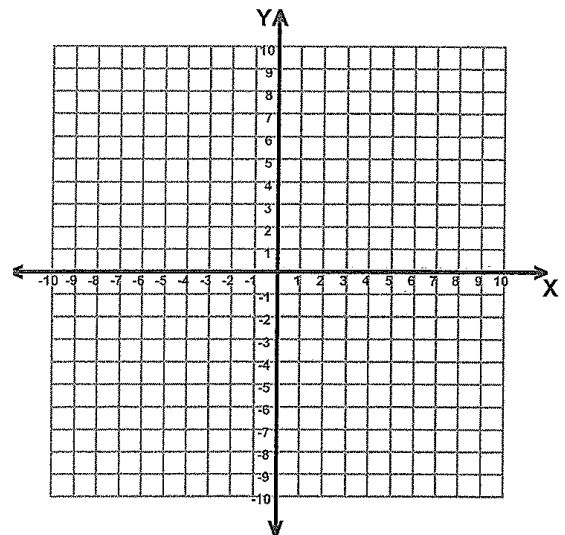
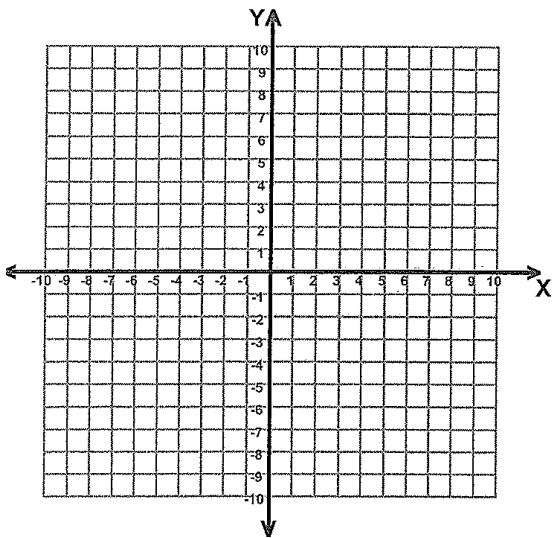
1)  $y = 2x - 10$

2)  $y = -3x + 8$



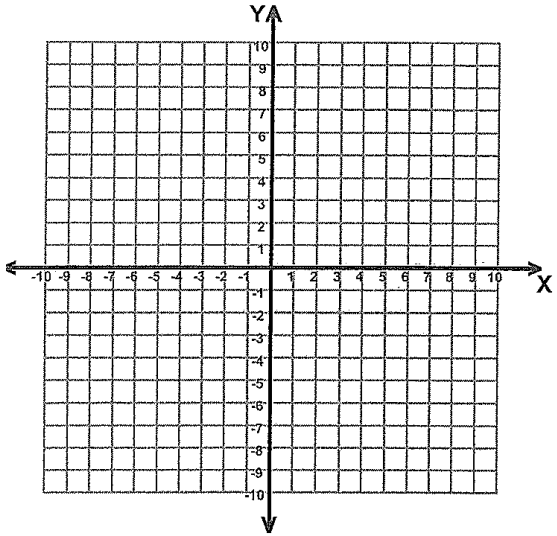
3)  $y = x - 5$

4)  $y = -x + 6$

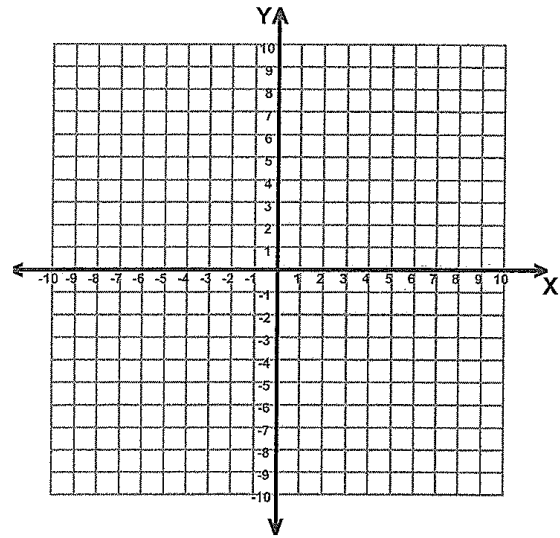




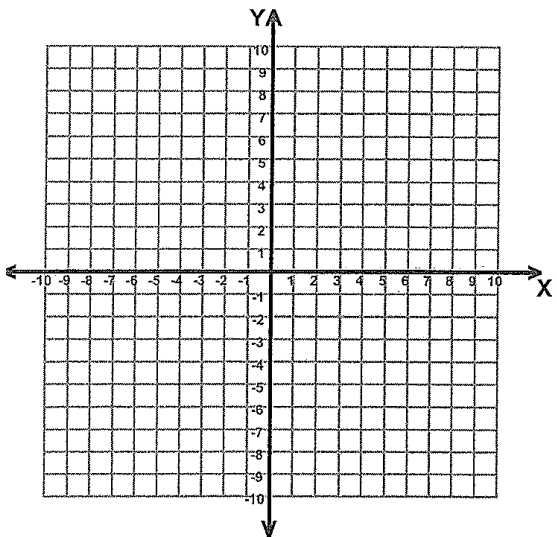
5)  $y = \frac{-1}{2}x + 7$



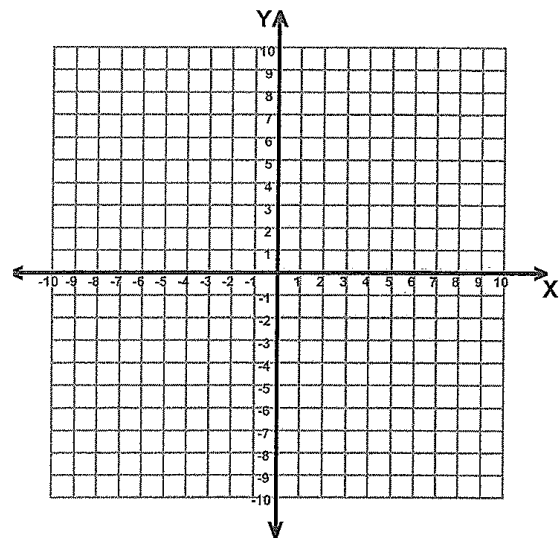
6)  $y = \frac{1}{3}x - 4$



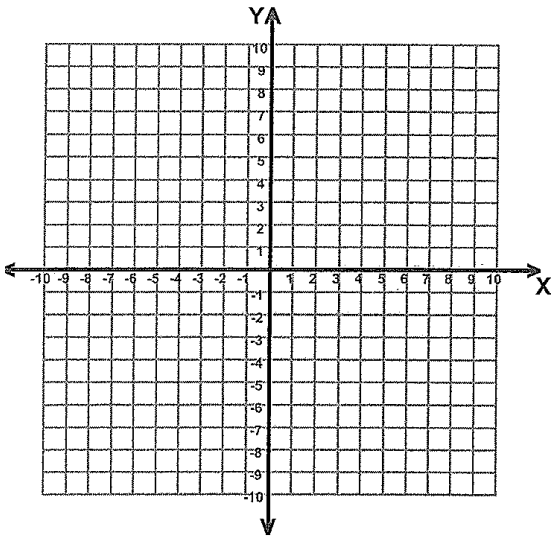
7)  $2x + y = 8$



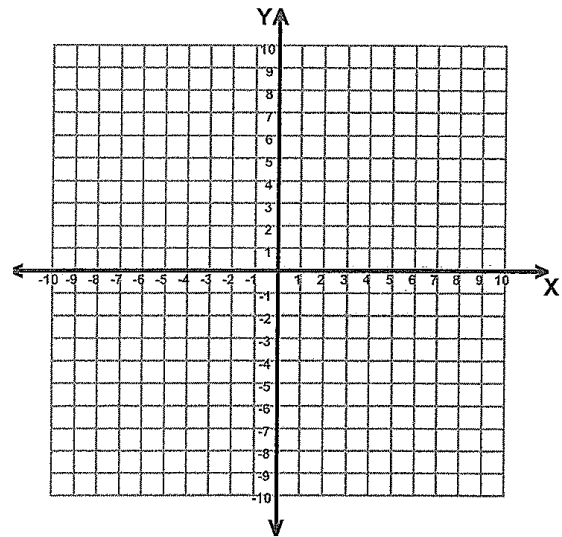
8)  $3x - y = + 2$



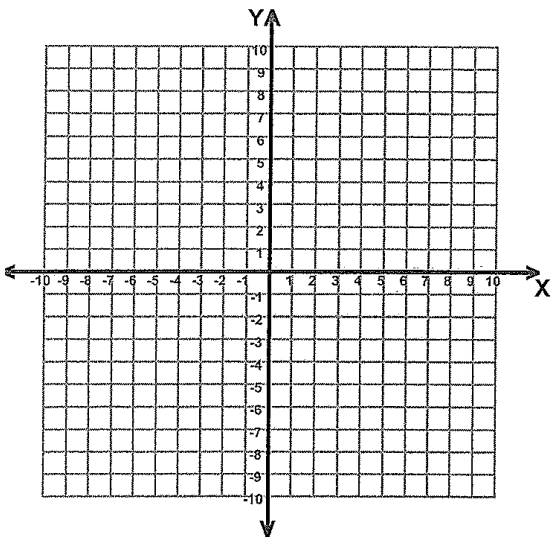
9)  $y = 5$



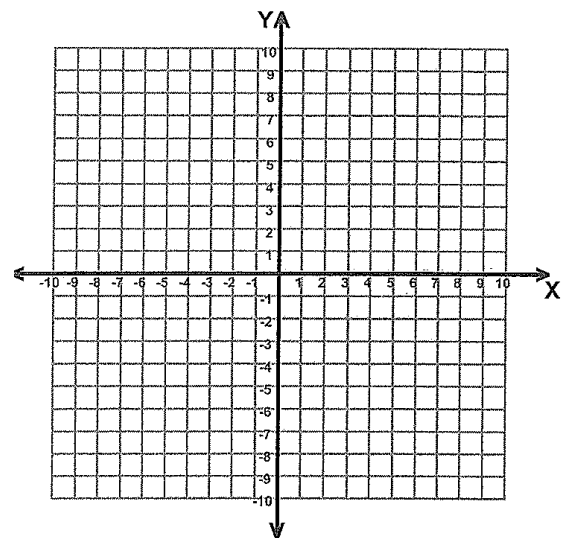
10)  $x = 3$



11)  $y = -4$



12)  $x = -6$



**Review Work:** Write the Function Rule of each

13)

x	y
2	110
4	120
6	130
8	140
10	150

14)

x	y
-2	-14
-1	-11
0	-8
1	-5
2	-2

## Lesson 7

### Graph a Line using both table and slope/ y intercept method

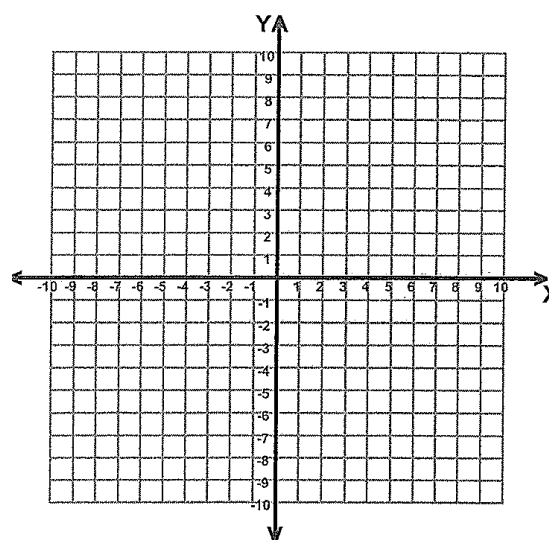
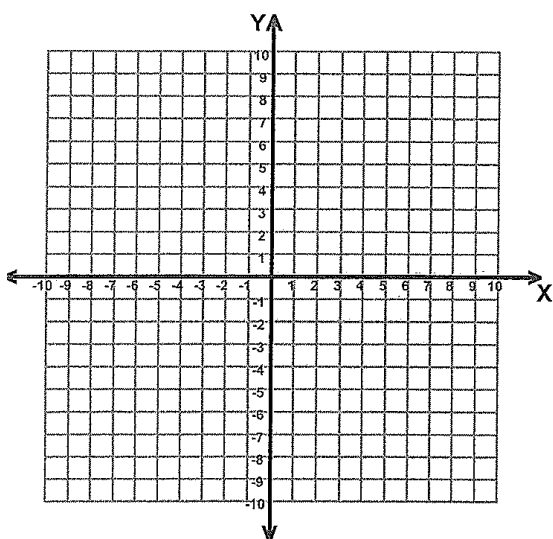
Complete each table. Then graph each solution.

1)  $y = -3x + 4$

x		y	(x,y)

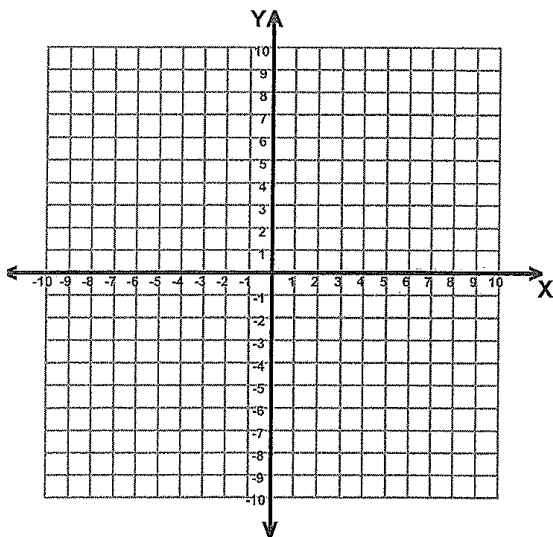
2)  $y = \frac{2}{3}x + 1$

x		y	(x,y)

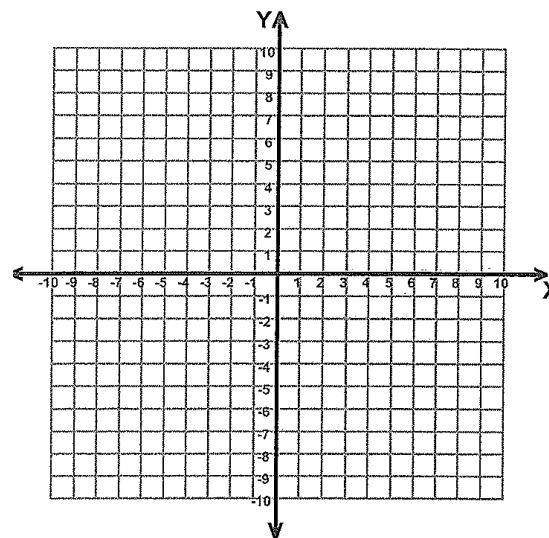


Graph each slope- y-intercept method

3)  $y = 2x + 4$



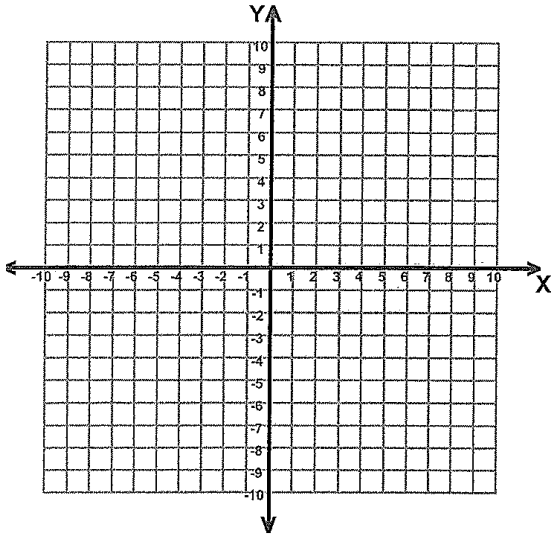
4)  $y = \frac{1}{2}x - 1$



Complete each table. Then graph each solution.

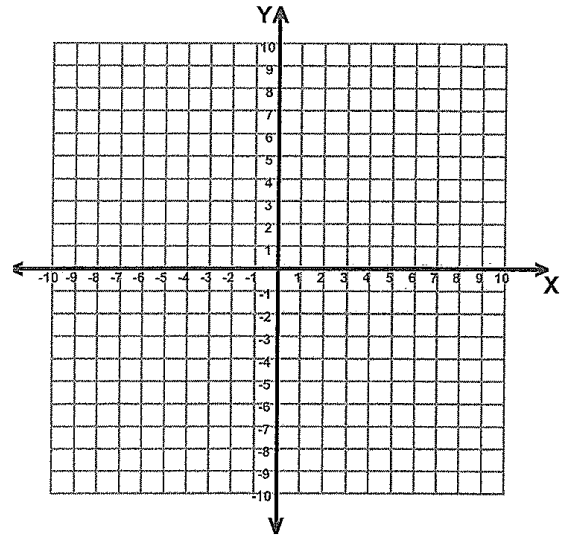
5)  $y = x - 6$

x		y	(x,y)



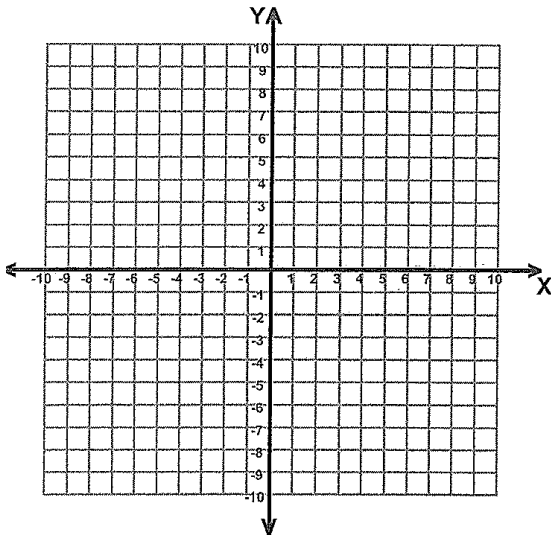
6)  $y - 2x = 1$

x		y	(x,y)

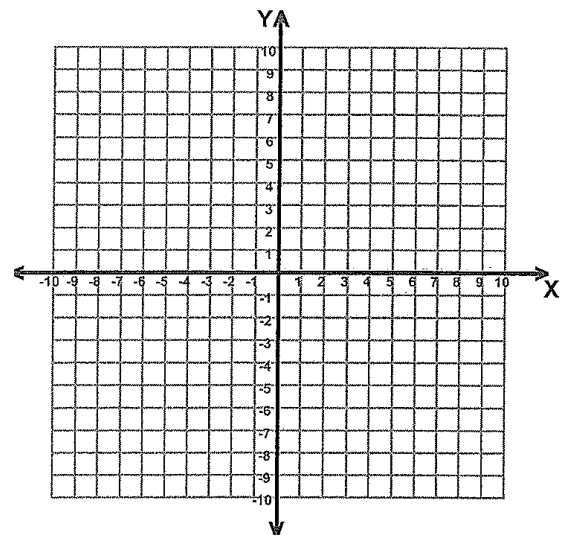


Graph each slope- y-intercept method

7)  $y = -2x + 4$

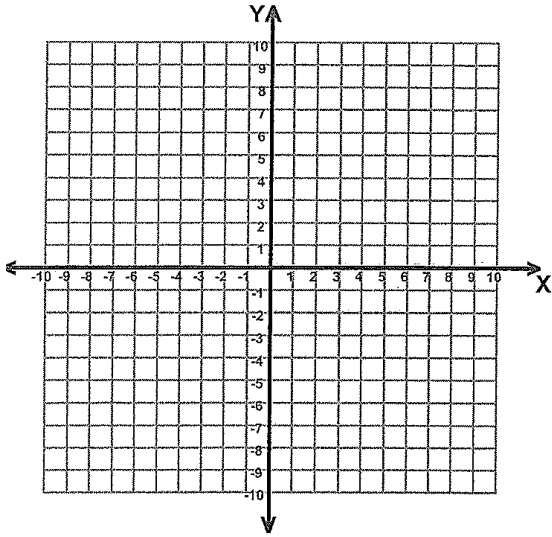


8)  $y - \frac{2}{3}x = 1$

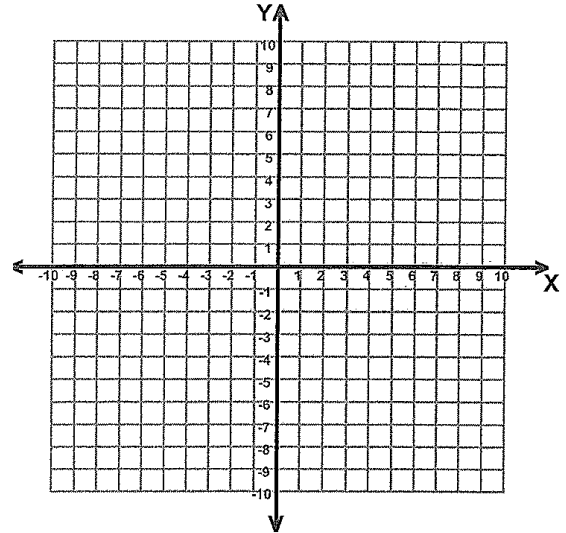


Graph each slope- y-intercept method

9)  $y = -4$

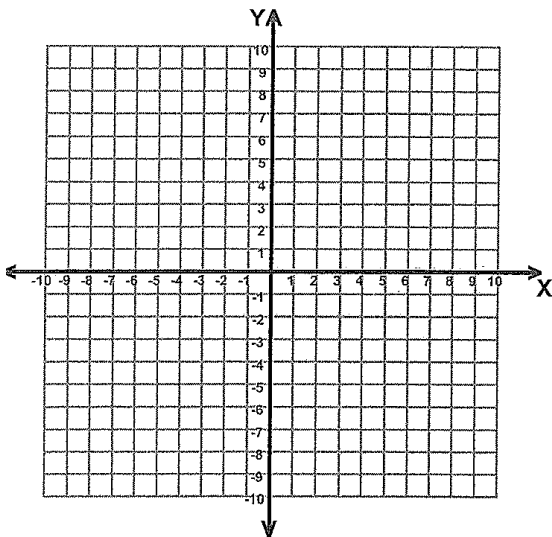


10)  $x = 3$

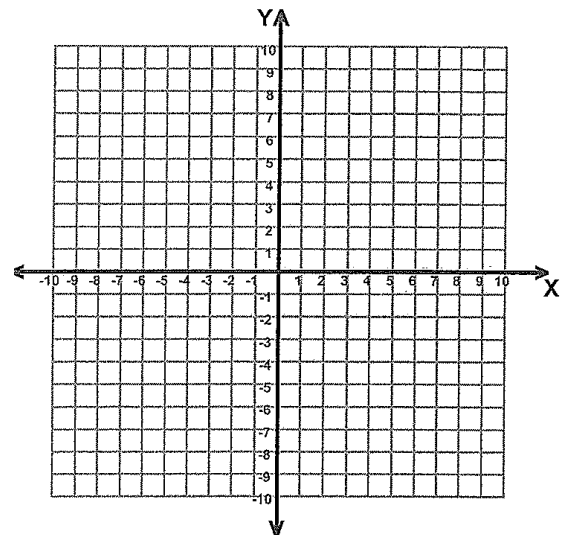


Graph each slope- y-intercept method

11)  $y = 8$



12)  $x = -9$



**Lesson 8**  
**Graph Systems of Equations (intersecting)**

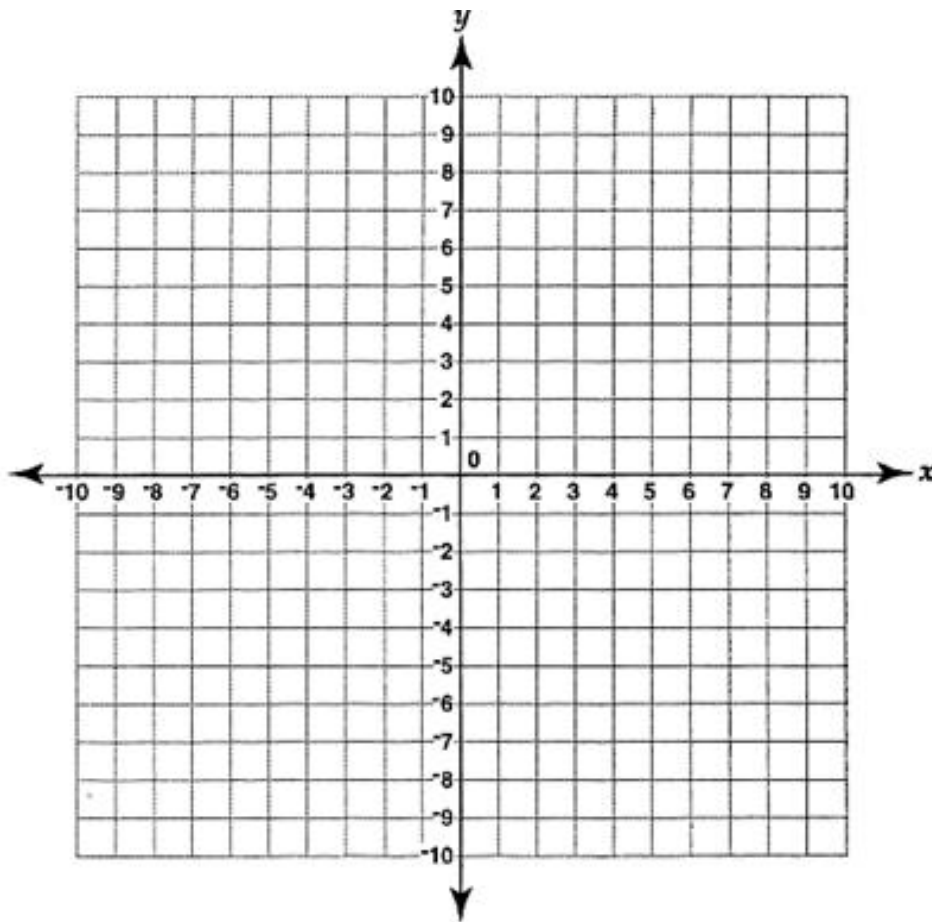
**Rules:**

- 1) Graph each equation on the same set of axes.
- 2) Find and Label the coordinates of the point of intersection of the lines.
- 3) Check both equations.

**Examples:**

- 1) Graph and Check:

$$y = -x + 2$$
$$y = 3x - 2$$

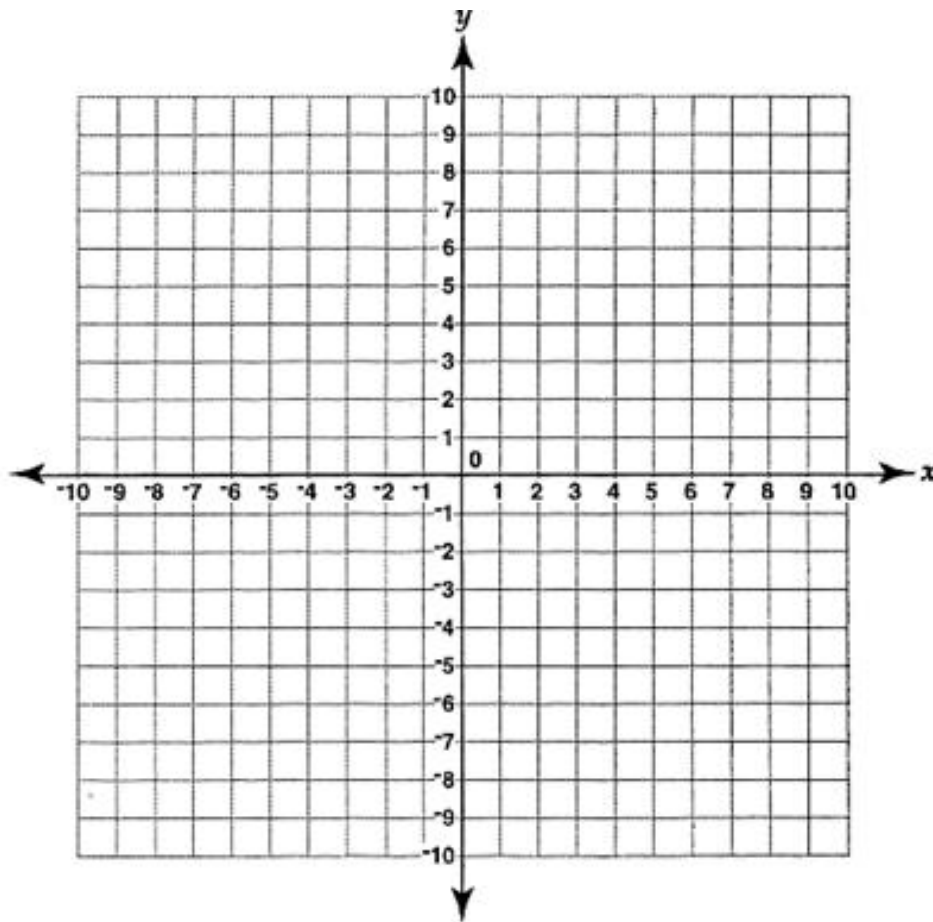


Check:

What is the solution? \_\_\_\_\_

2) Graph and Check:

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



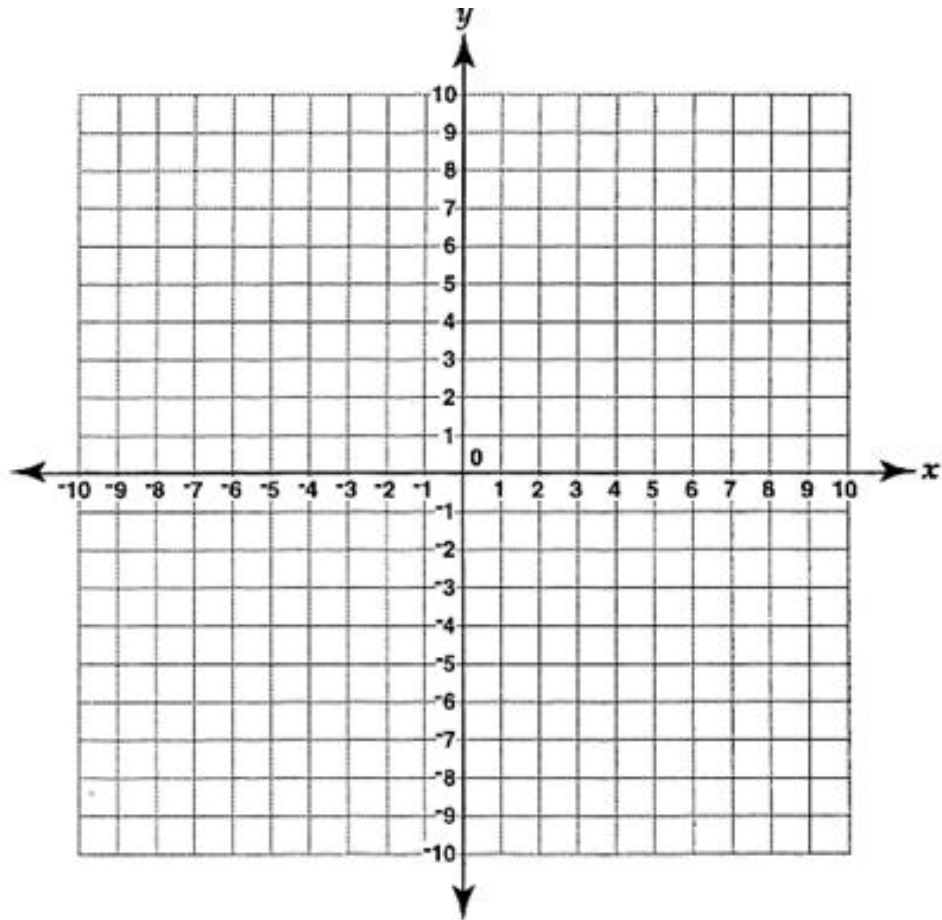
Check:

What is the solution? \_\_\_\_\_

3) Graph and Check:

$$y = 2x + 2$$

$$y = 2x - 6$$



Check:

What is the solution? \_\_\_\_\_

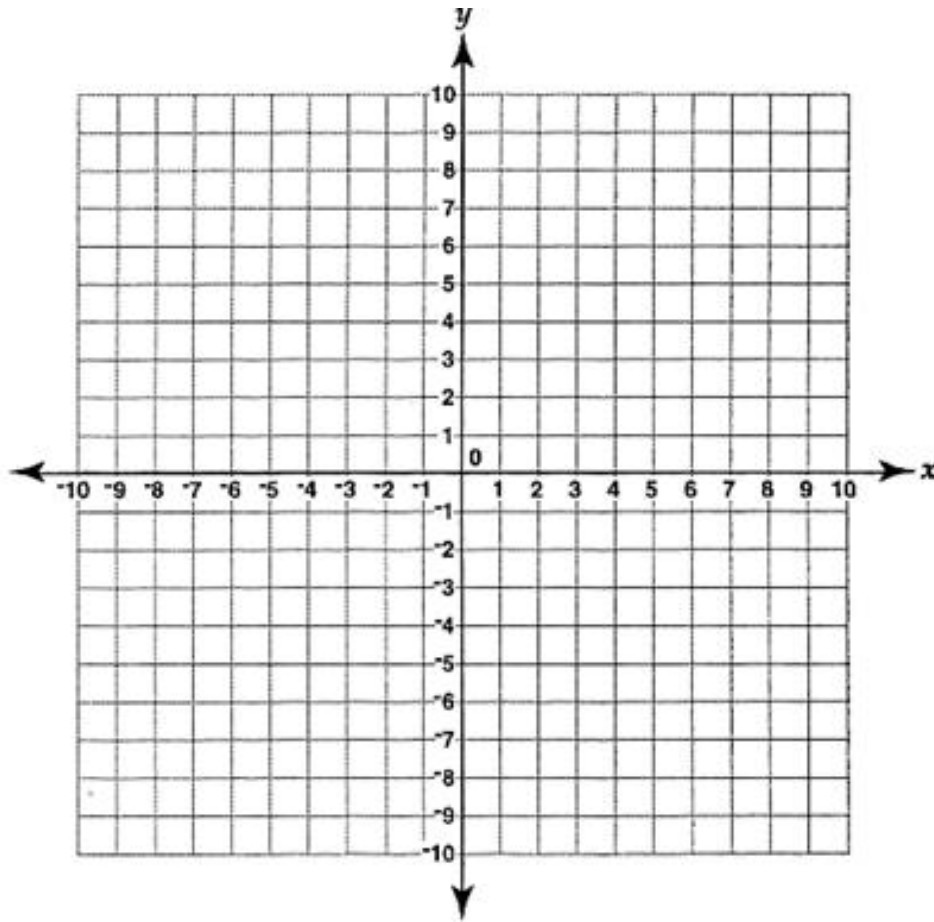


**Try These:**

1) Graph and Check:

$$y = 4x - 2$$

$$y = -x + 8$$



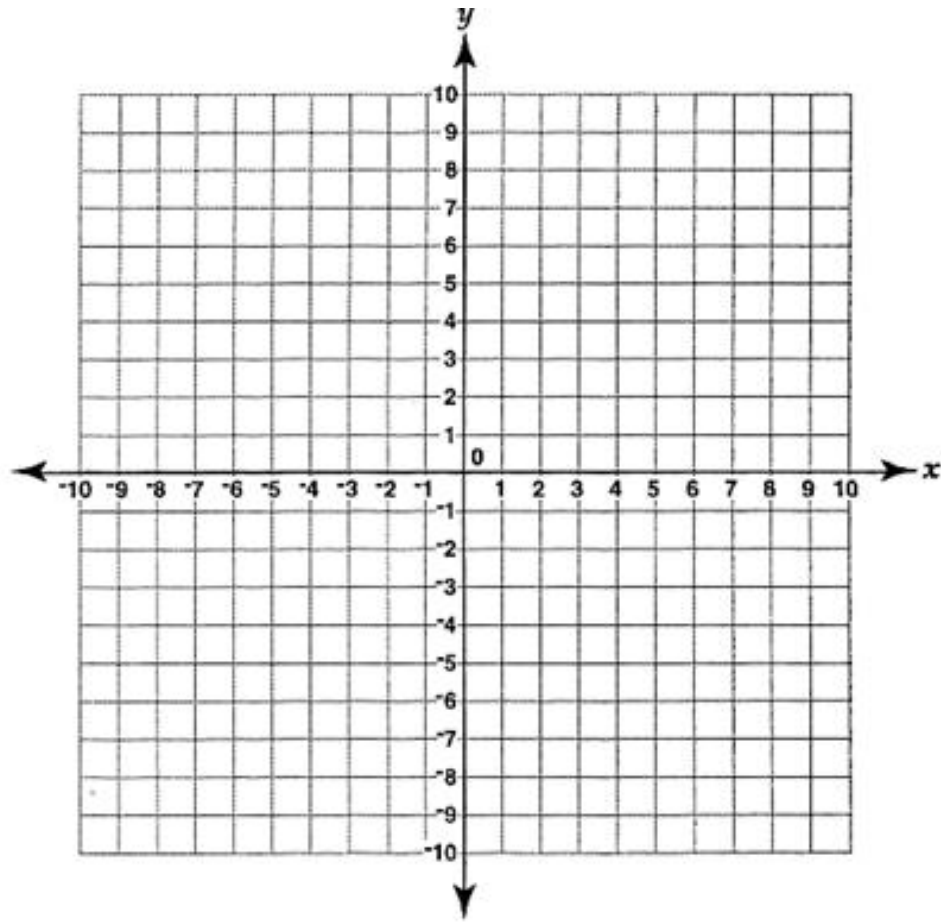
Check:

What is the solution? \_\_\_\_\_

2) Graph and Check:

$$y = -3x + 7$$

$$y = 2x - 3$$



Check:

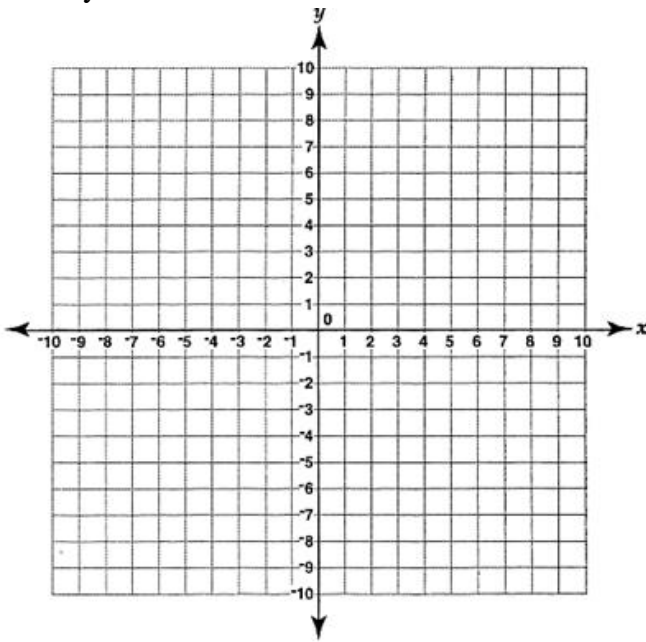
What is the solution? \_\_\_\_\_

## Lesson 8: Classwork/Homework

1) Graph and Check:

$$y = -4x + 5$$

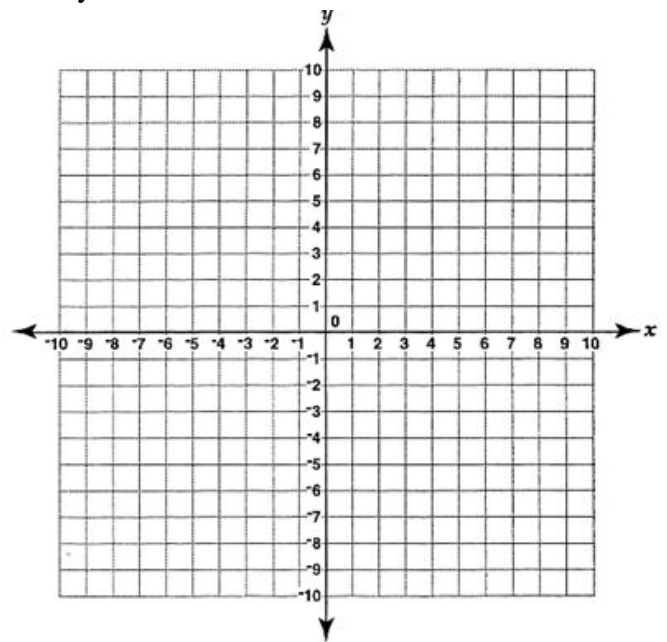
$$y = 3x - 9$$



2) Graph and Check:

$$y = x + 6$$

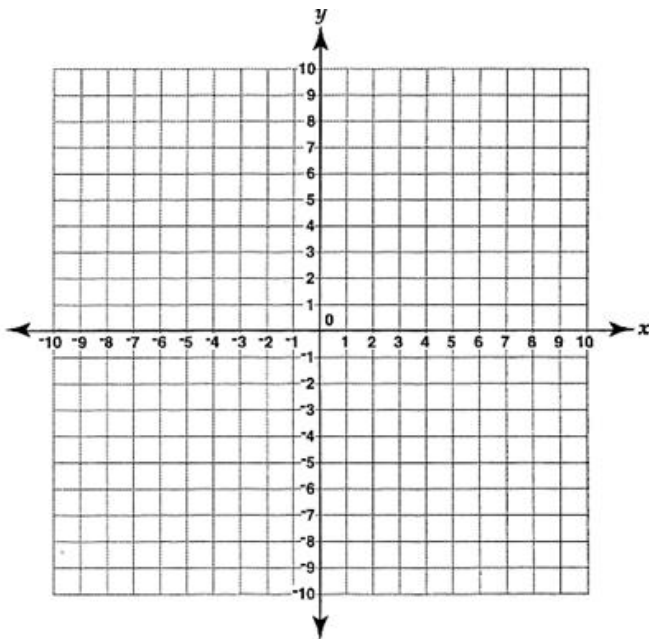
$$y = -2x$$



3) Graph and Check:

$$y = 4x - 3$$

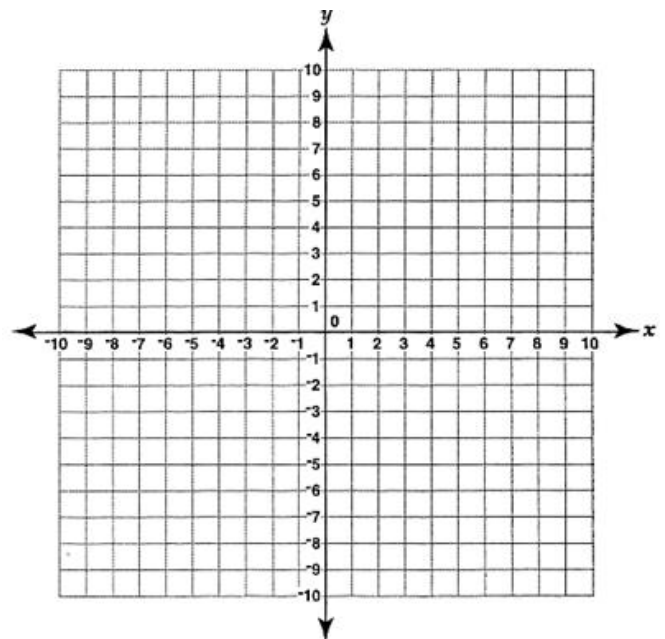
$$y = -2x + 9$$



4) Graph and Check:

$$y = \frac{3}{2}x - 3$$

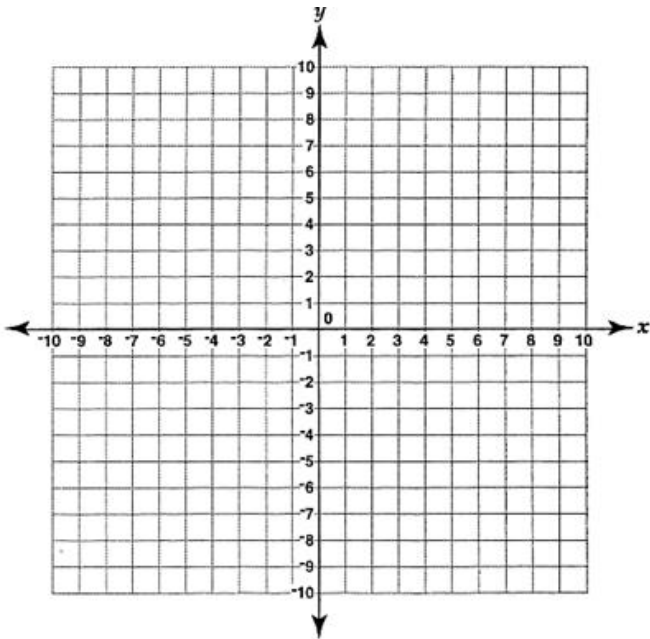
$$y = x - 2$$



5) Graph and Check:

$$y = x + 4$$

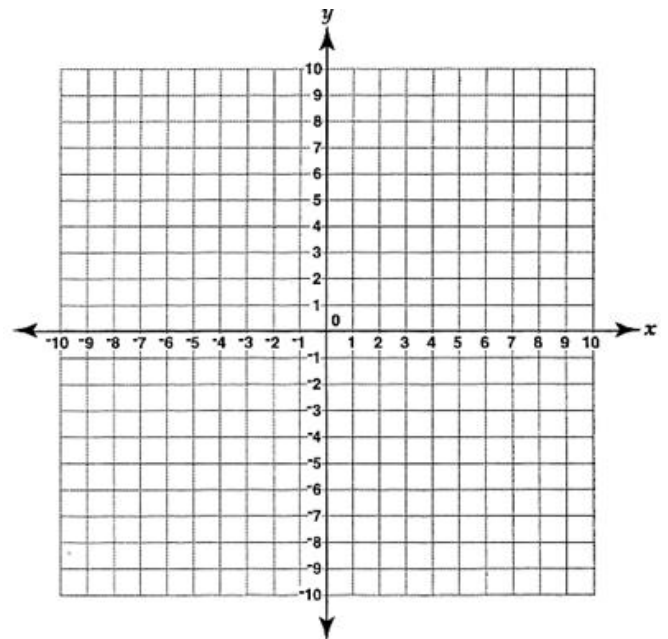
$$y = -2x + 7$$



6) Graph and Check:

$$y = -x + 7$$

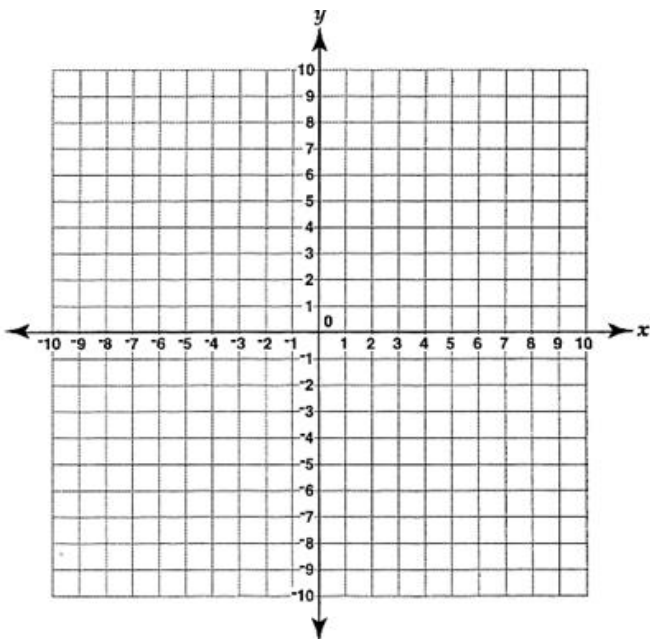
$$y = x - 1$$



7) Graph and Check:

$$y = -3x + 6$$

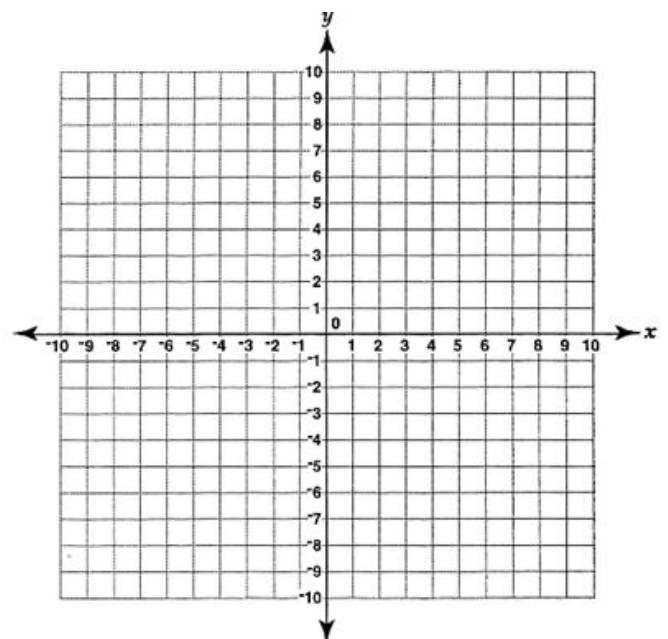
$$y = 3$$



8) Graph and Check:

$$x + y = 6$$

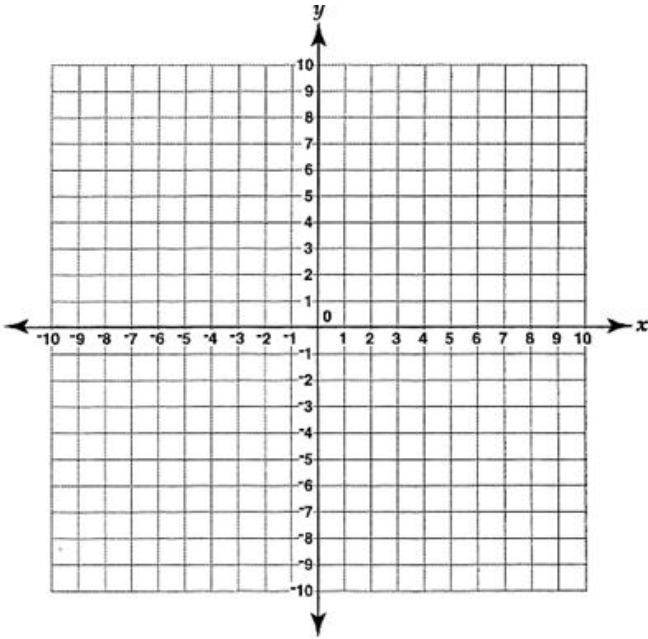
$$-2x + y = -3$$



9) Graph and Check:

$$y = x + 5$$

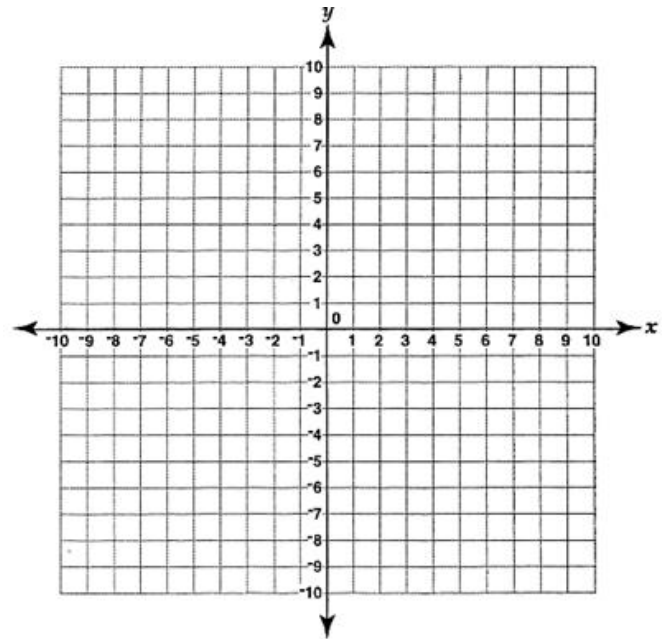
$$x = 3$$



10) Graph and Check:

$$x = 6$$

$$y = -3$$



---

Review Work:

11) A scuba diver goes 94 ft. below the surface of the ocean, and then descends 87 ft. farther.  
What is the diver's depth?

---

12)  $(-11 + w)(-2)$

13)  $-2(43)(-5)$

---

14) The answer to solving an equation is  $4 = 7$ . What does that mean?

---

15) Solve for x:  $0.9x - 4 = 3x + 2.3$

Rewrite the equation in function form ( $y = mx + b$ )

1)  $5x + y = 4$

2)  $3x - y = 9$

3)  $-x + y = 17$

4)  $5y - 2x = 15$

5)  $2(y - 4) = 8$

$y = 5x - 10$

6) What is the slope? \_\_\_\_\_

7) What is the y-intercept? \_\_\_\_\_

$y = -2x + 5$

8)  $b =$  \_\_\_\_\_

9)  $m =$  \_\_\_\_\_

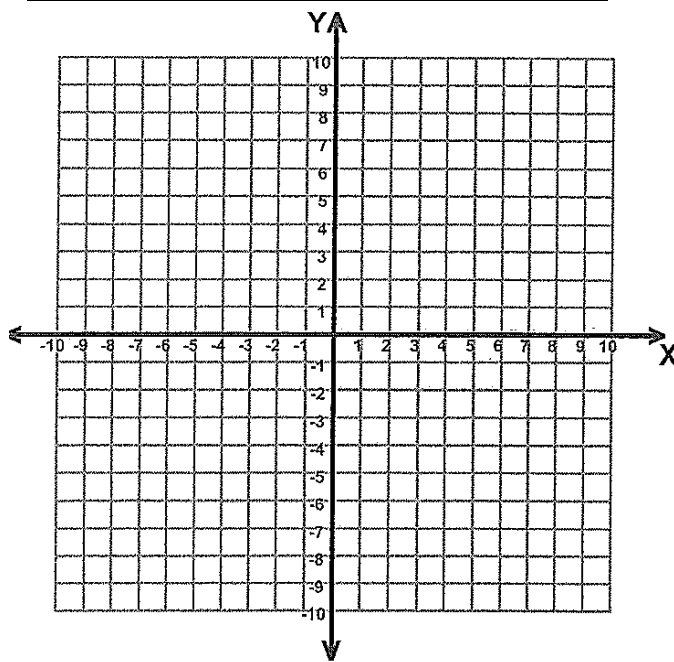
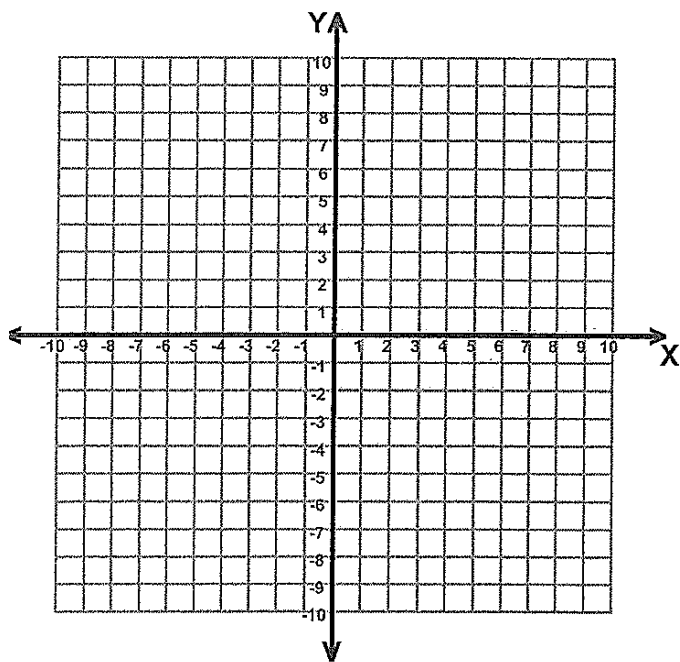
Graph the following lines using the table method:

10)  $y = -3x + 5$

11)  $x + y = 2$

x		y	(x,y)

x		y	(x,y)

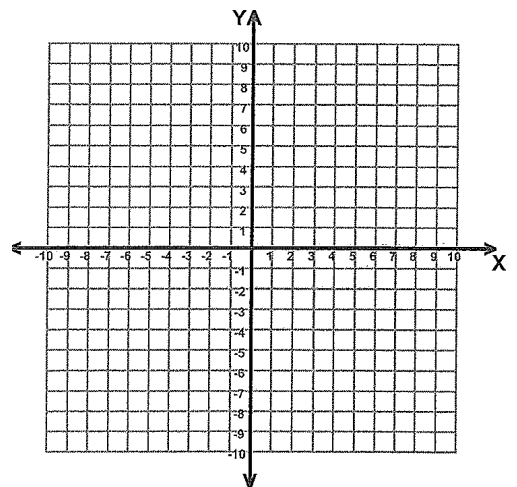
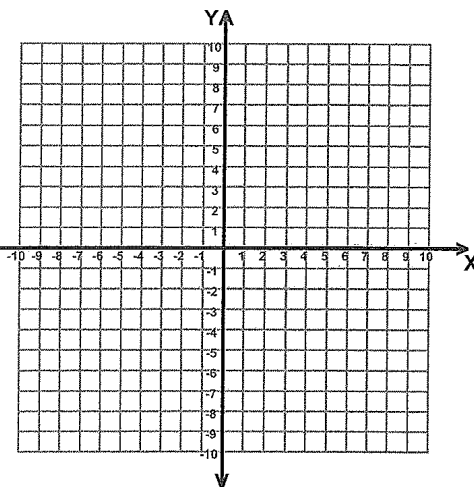
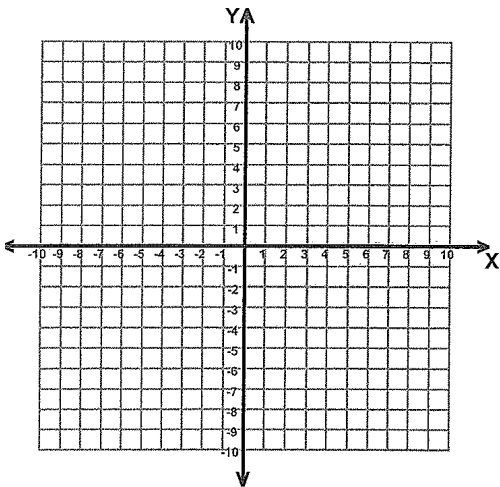


Graph the following lines using the slope-intercept method:

12)  $y = 3x - 5$

13)  $y = \frac{1}{2}x - 3$

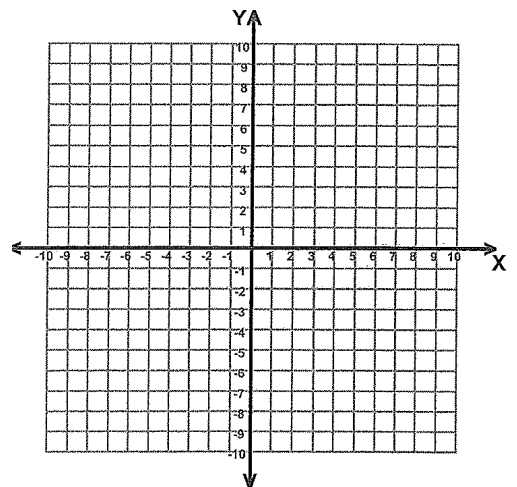
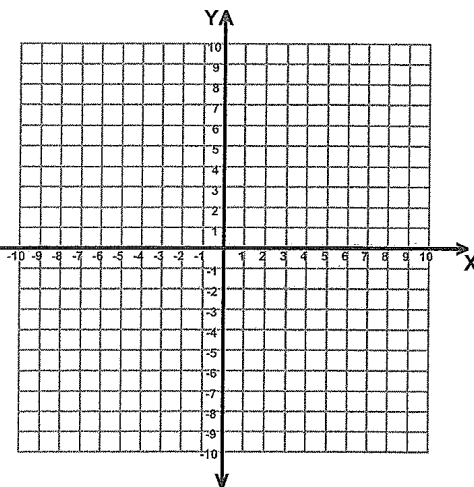
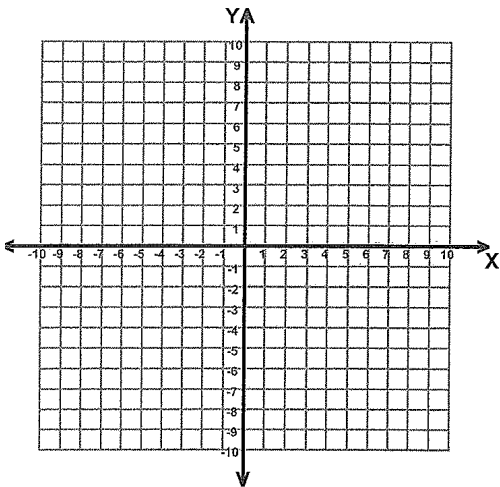
14)  $y = -x + 4$



15)  $2x + y = 5$

16) Graph any method:  
 $y = 2$

17) Graph any method:  
 $x = -3$



Write the function rule and find the missing number in the table:

18)

x	y
4	11
8	19
12	27
16	35
20	43
40	

19)

x	4	5	6	7	8	20
y	10	20	30	40	50	

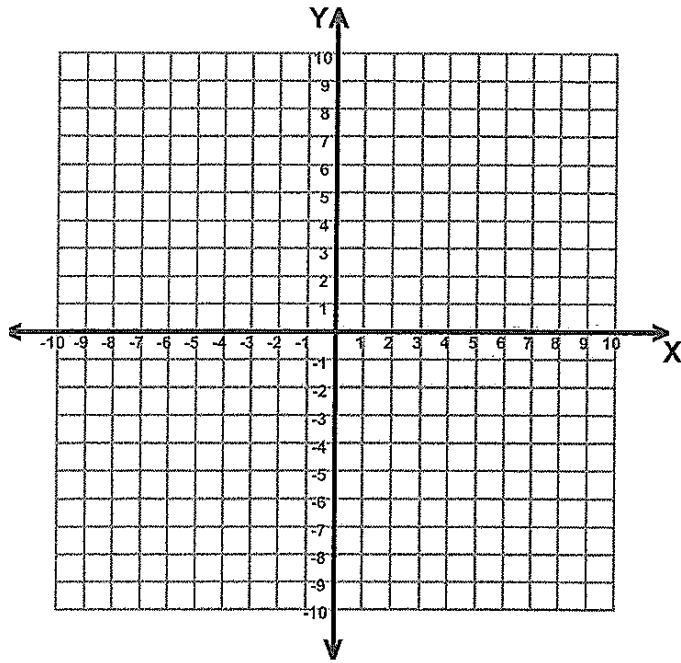
20) Graph the system of equations:

$$y = x + 4$$

$$y = -2x + 7$$

21) What is the solution? \_\_\_\_\_

22) Check the solution:



---

**Unit 3: Simplify. Exponents must be placed in positive exponential form.**

23)  $3^{-5} \cdot 3^{-7}$

24)  $3^7 \cdot 2^1$

25)  $5^{-2}$

26)  $x^0$

27)  $-2^0$

28)  $\frac{(-3x^4)(6x^{-2})}{9x}$

29)  $(-3a^{-4}bc^2)^3$

---

**Unit 2: Solving Equations**

**Solve the following equation for the missing variable, otherwise determine solution type**

30)  $5x - 6 = -41$

31)  $4(-3x + 2) = 44$

32)  $12 - 4x = 18$

---

33)  $3x + 5 = -15 + 4x$

34)  $0.7x - 0.2 + 0.5x = 1$

35)  $\frac{3}{5} + \frac{1}{4}x = \frac{1}{2}$

---

**Unit 1: Simplify**

36)  $\frac{\boxed{\phantom{000000}}}{3x - 4} \cdot 2x$

a) Find area of rectangle

b) Find the perimeter of the rectangle