

## Warm-Up



Using your calculator simplify the following questions:

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

2)  $5\sqrt{36} - 3\sqrt{49}$

3) Evaluate to *nearest tenth*:  

$$\frac{(8-3)^2 - (-2)}{4} =$$

4)  $-9 + 3[4 - (5 - 16)]$

Sep 8-4:06 PM

## Unit 1: Basic Algebra

Lesson:  
 PEMDAS  
 and  
 Evaluating

«THINK LEFT &  
 THINK RIGHT»  
 & THINK LOW  
 AND think high  
 OH, THE THINGS  
 YOU CAN THINK UP  
 IF ONLY  
 YOU TRY!

-DR. SEUSS, OH, THE THINGS YOU CAN THINK!

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Jul 9-11:21 AM

# PEMDAS

↖

Parenthesis

↖

Exponents


↖

Multiplication  
Division

↖

Addition  
Subtraction

Please Excuse My  
Dear Aunt Sally!



$$6 - (5 - 3) + 10$$

$$= 6 - 2 + 10$$

$$= 4 + 10$$

$$= 14$$

Jul 9-1:40 PM

**Order of Operations:** Proceed in this order:

1. parentheses are done first
2. exponents are done next
3. multiplication and division (done as they are encountered left to right)
4. addition and subtraction (done as they are encountered left to right)



While PEMDAS lists M before D, remember that multiplication and division are done as they are read from left to right. It may not always be the case that multiplication is done before division.

The expression  $16 \div 4 \times 2 = 8$  (not 2).

The same is true of addition and subtraction:  $8 - 4 + 2 = 6$  (not 2).

When working with numerical or algebraic expressions containing two or more operations, there is a conventional order in which operations are performed. If an ordering precedence did not exist, operations could potentially yield more than one correct answer.

Does  $9 - 3 \times 2 = 3$ ? **OR** Does  $9 - 3 \times 2 = 12$ ?

This one is correct!

This one is NOT correct!

Aug 4-2:16 PM

Students will be able to evaluate using the proper order of operations

Explain the difference between

$$(-5)^2 \text{ and } -5^2$$

Aug 28-3:30 PM

Students will be able to evaluate using the proper order of operations

Simplify this expression using the proper order of operations. At each step. Write what operation you completed!! Use your calculator to check your answer.

$$40 - 2(6 - 4)^2$$

Aug 4-2:16 PM

Students will be able to evaluate using the proper order of operations

Simplify each problem using your knowledge of order of operations

1)  $[3(-2)^2 - 2(-3)^2]^3$

2)  $2(20 - 32 + 1) - (42 \div 2 \times 3)$

Aug 4-2:16 PM

A **variable** is a letter, for example x, y or z, that represents an unspecified number.

$$6 + x = 12$$

To **evaluate** an algebraic **expression**, you have to **substitute** a number for each variable and perform the arithmetic operations.

In the example above, the variable x is equal to 6 since  $6 + 6 = 12$ . If we know the value of our variables, we can replace the variables with their values and then evaluate the expression.

Aug 27-3:03 PM

Remember this Trick!!!!

How to Store a number in your calculator

# you  
want to  
store

Sto >

ALPHA

Letter you  
want

**YOU STILL HAVE TO  
SHOW YOUR WORK!!!!**

Aug 27-3:55 PM

Students will be able to evaluate using the proper order of operations

**Evaluate** the following expression when  $x = 9$ :

$$5x + 4$$

**Evaluate** the following expression when  $y = -2$ :

$$3 + 7y$$

Aug 27-3:46 PM

Students will be able to evaluate using the proper order of operations

The power, in watts, consumed by an electric light bulb is given by the formula  $P = 121x^2$ , where  $x$  is the number of amperes of electric current passing through it.

How much power will this light bulb consume if there is a current of 0.91 amperes passing through it? Round to the nearest whole number.

Aug 27-3:46 PM

Students will be able to evaluate using the proper order of operations

**Evaluate** the following expression when  $d = 3$  and  $c = 5$ .

$$9d^2 + 4c - 9$$

Aug 27-3:46 PM

- Students will be able to evaluate expressions using the proper order of operations
- Students will be able to translate a quantitative verbal phrase into an algebraic expression

In the second basketball game of the season, Wesley scored two fewer points than three times the number of points he scored in the first game. Let  $p$  represent the number of points Wesley scored in the first game.

- Write an expression that can be used to find the number of points scored in the second game.



- If  $p = 11$ , find how many points Wesley scored in the second game.

Aug 28-3:38 PM

Students will be able to evaluate using the proper order of operations

Let  $x = 8$

Evaluate:  $2x + 5$

Let  $x = 5$  and  $y = -1$

Evaluate:  $y^2 + 3x$

Let  $x = 2$ ,  $y = -4$  and  $z = 0$

Evaluate:  $x^3 - y^2 + z$

Aug 27-4:09 PM

Students will be able to evaluate using the proper order of operations

Skyler completed the following problem. Determine if she is correct. If she is not, explain her error and find the correct solution

**Evaluate  $-2x^2 - 5y^3$  if  $x = -4$  and  $y = -1$**

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

$$-2(-16) - 5(-1)$$

$$32 + 5$$

$$37$$

Aug 28-3:46 PM

## HOMEWORK:

Evaluate each using the values given.

1)  $y \div 2 + x$ ; use  $x = 1$ , and  $y = 2$

2)  $a - 5 - b$ ; use  $a = 10$ , and  $b = 4$

3)  $p^2 + m$ ; use  $m = 1$ , and  $p = 5$

4)  $y + 9 - x$ ; use  $x = 1$ , and  $y = 3$

5)  $m + p \div 5$ ; use  $m = 1$ , and  $p = 5$

6)  $y^2 - x$ ; use  $x = 7$ , and  $y = 7$

Aug 27-4:15 PM



## HOMEWORK:

7)  $5(10 - 1)$

8)  $48 \div (4 + 4)$

9)  $20 \div (4 - (10 - 8))$

10)  $40 \div 4 - (5 - 3)$

11)  $9 + 9 + 6 - 5$

12)  $(5 + 16) \div 7 - 2$

Aug 27-4:15 PM

**Answers:**

1) 2

7) 45

2) 1

8) 6

3) 26

9) 10

4) 11

10) 8

5) 2

11) 19

6) 42

12) 1

$$p^2 + m$$
$$5^2 + 1$$

$$48 \div (4 + 4)$$
$$48 \div 8 = 6$$

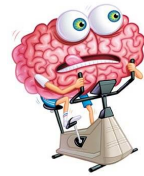
$$20 \div (4 - (10 - 8))$$
$$20 \div (4 - (2))$$
$$20 \div 2$$
$$\checkmark$$
$$10$$

Sep 10-4:38 PM

## Warm - up

1) Evaluate the expression  $2m - r$  for  $r = -1$  and  $m = 6$ .

2) Simplify:  $3^5 + \sqrt{36} \cdot (5 + 4) \div 3 - 7$



Sep 10-3:21 PM

## Unit 1: Basic Algebra

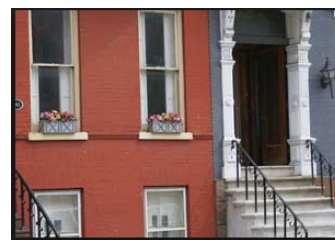
Lesson:  
Properties



Jul 9-11:21 AM

I can identify the Commutative Property

**Commutative Property** is similar to commuting back and forth to school.



Feb 12-7:59 PM

## Commutative Property of Addition

*"Add in any order."*

$$\star a + b = b + a \star$$

$$5 + 4 = \underline{\hspace{2cm}}$$

## Commutative Property of Multiplication

*"Multiply in any order."*

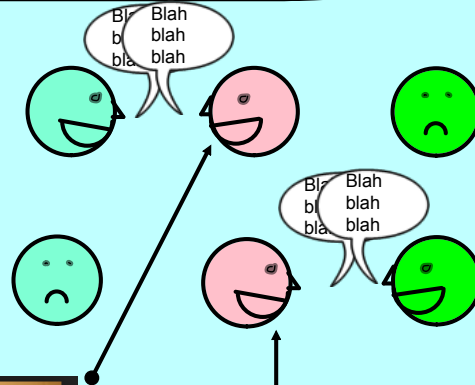
$$\star (a)(b) = (b)(a) \star$$

$$(2)(9) = \underline{\hspace{2cm}}$$

Feb 12-1:28 PM

I can identify the Associative Property

**Associative Property** is similar to Associating with the people sitting next to you.



**Cheating boyfriend/  
girlfriend!**

**Associative Property**



Feb 12-7:59 PM

### Associative Property of Addition

*We can group terms in any way.*

$$(6 + 4) + 5 = \underline{\hspace{2cm}}$$

### Associative Property of Multiplication

★ *We can group terms in any way.*

Example:  $10 + 4 + 5 =$

Which expression is equivalent to  $(2 + 3) + 6$ ?

- A.  $(2 - 3) + 6$     B.  $(2 \cdot 3) + 6$     C.  $(2/3) + 6$     D.  $2 + (3 + 6)$

Feb 12-1:28 PM

## Is Commutative and Associative true under Subtraction and Division?

Let's do a little further investigation of the properties of real numbers.

Property: <b>Commutative</b>	Are these statements True or False?	If false, give a counterexample.
Addition: $a + b = b + a$		
Subtraction: $a - b = b - a$		
Multiplication: $a \cdot b = b \cdot a$		
Division: $a / b = b / a$		

Property: <b>Associative</b>	Are these statements True or False?	If false, give a counterexample.
Addition: $(a + b) + c = a + (b + c)$		
Subtraction: $(a - b) - c = a - (b - c)$		
Multiplication: $(a \cdot b) \cdot c = a \cdot (b \cdot c)$		
Division: $(a / b) / c = a / (b / c)$		

Aug 4-1:49 PM

I can identify the distributive property

### What does it mean to distribute?

Ex: Passing out homework to everyone in the class



Distributive Property

I can identify the distributive property

## Distributive Property

is used to multiply a single term and two or more terms inside a set of parentheses.



$$a(b + c) = a \cdot b + a \cdot c$$



Let's try:

a)  $4(2 + a) =$  \_\_\_\_\_

b)  $-3(2 + 10b) =$  \_\_\_\_\_

c)  $5(2x - 5) =$  \_\_\_\_\_

Sep 12-6:27 PM

I can identify the distributive property

### You Try!!!

a)  $6(-3a + 5)$

b)  $x(5x - 6)$

c)  $-(3 - 4b)$

Jul 9-12:59 PM

I can identify the distributive property

### We Try!!

d)  $2(x^2 - 3x + 5)$

e)  $-3x(x^2 + 10x - 2)$

f)  $-(x^3 - 5x - 1)$

Jul 9-1:06 PM

### Identity Property of Addition

*Zero added to any number is the number itself.*

Example:  $5 + \underline{\quad} = 5$

### Identity Property of Multiplication

*One multiplied by any number gives the number itself.*

Example:  $6 \cdot \underline{\quad} = 6$

Feb 12-1:28 PM

**Inverse** Property of Addition*"Negate the number and add to **get 0.**"*

**Example:**  $5 + \underline{\quad} = 0$

**Inverse** Property of Multiplication*"Flip the fraction and multiply to **get 1.**"*

**Example:**  $5 \cdot \underline{\quad} = 1$

Feb 12-1:28 PM

**Name the property that each equation illustrates.****Commutative****Associative****Inverse****Distributive****Identity**

a)  $-3 \cdot -\frac{1}{3} = 1$

d)  $3(8 \cdot 0) = (3 \cdot 8)0$

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

e)  $p + q = q + p$

c)  $2 + 0 = 2$

f)  $np = pn$

Feb 12-8:20 PM



## Homework:

## Properties of Real Numbers

Name \_\_\_\_\_



Match each statement with the property it exemplifies. Place the matching letter in the box.

- |  |   |
|--|---|
| <input type="checkbox"/> 1. $x + (y + z) = (x + y) + z$            | a. Additive Inverse Property              |
| <input checked="" type="checkbox"/> 2. $(pq) \cdot 1 = pq$         | b. Multiplicative Inverse Property        |
| <input type="checkbox"/> 3. $(5x)y = 5(xy)$                        | c. Commutative Property of Multiplication |
| <input type="checkbox"/> 4. $a + 5b = 5b + a$                      | d. Multiplicative Identity                |
| <input type="checkbox"/> 5. $a + 0 = a$                            | e. Commutative Property of Addition       |
| <input type="checkbox"/> 6. $gh = hg$                              | f. Associative Property of Addition       |
| <input type="checkbox"/> 7. $8 + (-8) = 0$                         | g. Distributive Property                  |
| <input type="checkbox"/> 8. $x \cdot 0 = 0$                        | h. Associative Property of Multiplication |
| <input type="checkbox"/> 9. $5 \cdot \left(\frac{1}{5}\right) = 1$ | i. Additive Identity Property             |
| <input type="checkbox"/> 10. $2(a + b) = 2a + 2b$                  | j. Zero Property                          |

Additive Identity

#1-10

11. Does the associative property work over subtraction? Show an example to support your answer.

12. Is it true that the order when dividing three real numbers does not affect the answer? Show an example to support your answer?

13. Is this statement true?  $(x + y) - z = x + (y - z)$   
Support your answer either numerically or algebraically.

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## Homework:

14. What is the additive inverse of -3?

15. Use the commutative property to write an equivalent expression to:  $7.4a + 8b$ 16. Use the distributive property to write an equivalent expression to:  $-4(5x + 9)$ 17. Use the distributive property to write an equivalent expression to:  $3(4a + 6b + 3c)$ 18. Use the distributive property to write an equivalent expression to:  $-(2x + 3y)$ 19. What is the multiplicative inverse of  $\frac{1}{5}$ ?20. a. Use the distributive property to write an equivalent expression for:  $3(x - 4y) - 2(y + 7x)$ 

b. Simplify your answer.

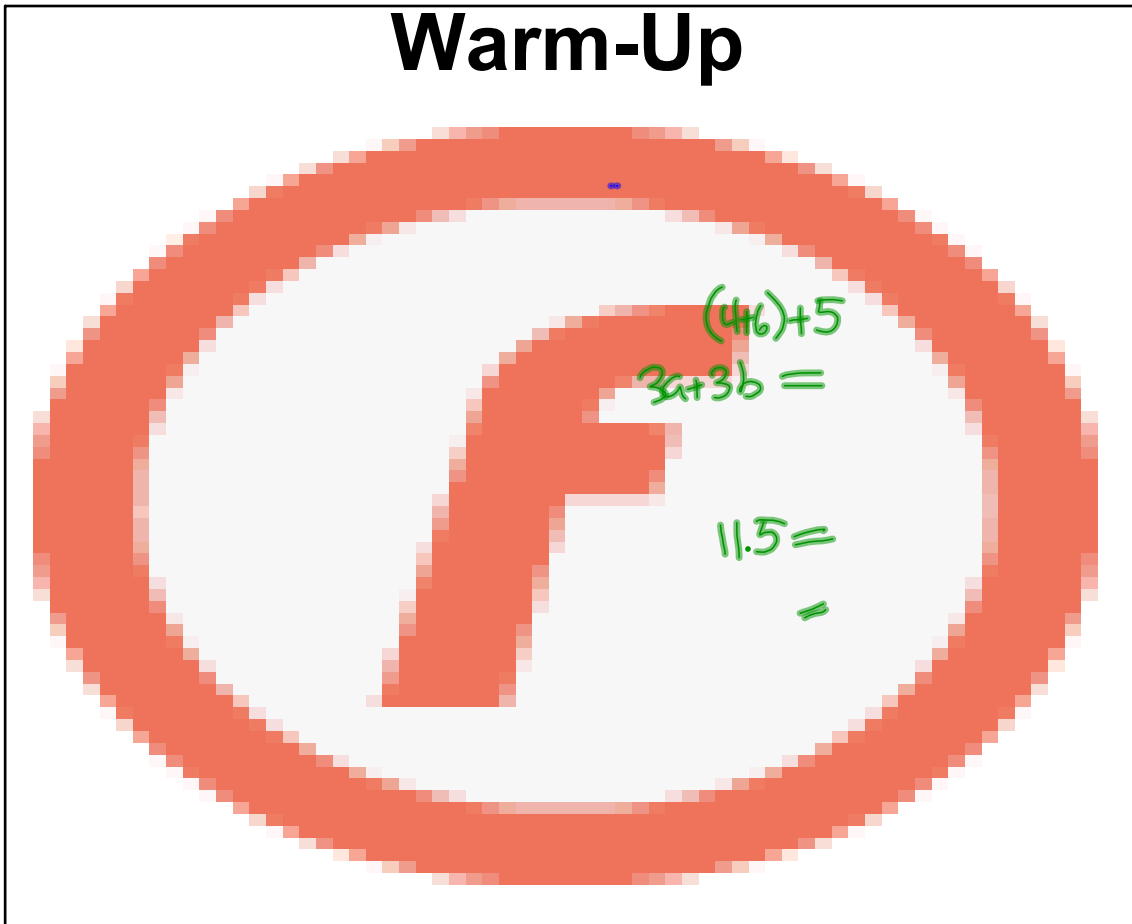
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## Answers to Homework

- |      |       |                 |                     |
|------|-------|-----------------|---------------------|
| 1) F | 6) C  | 11) No          | 16) $-20x - 36$     |
| 2) D | 7) A  | 12) Yes         | 17) $12a + 1b + 9c$ |
| 3) H | 8) J  | 13) No          | 18) $-2x - 3y$      |
| 4) E | 9) B  | 14) +3          | 19) 5               |
| 5) I | 10) G | 15) $8b + 7.4a$ | 20) $-4x - 14y$     |

Sep 10-4:43 PM

## Warm-Up



POD:N. Systems



Work with your partner to complete the following problems.

The expressions on the right have had their like terms combined. Match each expression on the left with an expression on the right.



$8x - 3x$

a.  $5x^2y + 2xy^2$

$3x + 9y - 5x$

b.  $5x$

$-4x - 5x - 7xy$

c.  $3x + 9y$

$6xy + 4yz - 3xy + yz$

d.  $3xy + 5yz$

$7x^2y - 2x^2y + 5xy^2 - 3xy^2$

e.  $-2x + 9y$

$-4x - 7xy + 8y$

f.  $-4x - 7xy + 8y$

$8x + 9y - 5x$

g.  $-9x - 7xy$

May 3-3:31 PM

I can simplify expressions by combining like terms

### Simplify each expression

1.  $-6x + 7x + 13x$

2.  $5x^2 - 9 - 7x^2 + 16$

3.  $3xy + 7x - 8xy + 9x$

4.  $8a^2 + 9a - 9a^2 - 17a$

May 3-12:21 PM

I can simplify expressions by combining like terms

Simplify:  $5(z - 6) + 4z$

Aug 27-5:10 PM

I can simplify expressions by combining like terms

Simplify:  $3(y - 6) + 12$

Aug 27-5:10 PM

I can simplify expressions by combining like terms

Simplify:  $6(5-3t) - 17 + 5t$

Aug 27-5:10 PM

I can simplify expressions by combining like terms

Simplify:  $-6(r-2s) + 3(2r+s)$

Aug 27-5:10 PM

Students will be able to add and subtract monomials , as well as using the distributive property

Find the perimeter of this rectangle and simplify that expression.



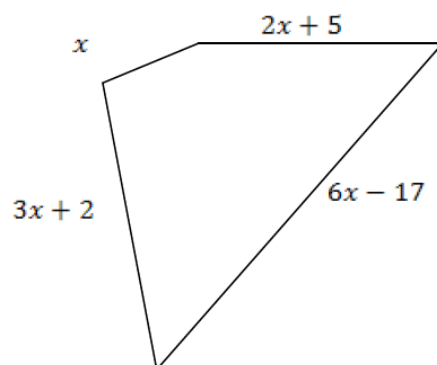
$$3m + 1$$

$$7m - 9 + n$$

Aug 27-6:05 PM

Students will be able to add and subtract monomials , as well as using the distributive property

Write an expression for the perimeter of the figure below.



Aug 27-5:10 PM

**Homework:**

19)  $-16n - 14n$

20)  $15n - 19n$

21)  $-4 + 7(1 - 3m)$

22)  $-5n + 3(6 + 7n)$

23)  $-2n - (9 - 10n)$

24)  $10 - 5(9n - 9)$

25)  $9a + 10(6a - 1)$

26)  $-9(6m - 3) + 6(1 + 4m)$

27)  $-10(1 - 9x) + 6(x - 10)$

28)  $5(-2n + 4) + 2(n + 3)$

Aug 27-5:19 PM

**Answers to the Homework**

19)  $-30n$

24)  $-45n + 55$

20)  $-4n$

25)  $69a - 10$

21)  $3 - 21m$

26)  $33 - 30m$

22)  $16n + 18$

27)  $96x - 70$

23)  $-9 + 7n$

28)  $-8n + 26$

Sep 10-4:49 PM



## Warm-up

Ashley has a jar full of math expressions. she reaches in an pulls out a piece of paper that says " $7x - 3$ ". The next piece says " $-3x - x$ ". The third piece says " $5y + 5x$ ".  
Simplify the total of the 3 expressions.



Aug 28-4:12 PM

**Lesson:****Unit 1: Basics of Algebra**  
skipping**Activity**

**Please find a partner and work on the worksheet. Worksheet is due at the end of the period**

A dream doesn't become reality through magic; it takes sweat, **determination and hard work.**  
**-Colin Powell**

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Sep 7-1:50 PM

# Unit 1: Basic Algebra

Quiz #1: PMEDAS, Evaluating Expressions, Properties, and Combining like terms



Jul 9-11:21 AM