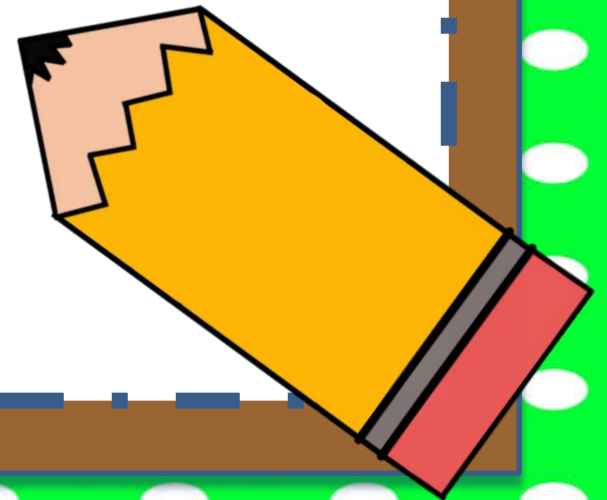
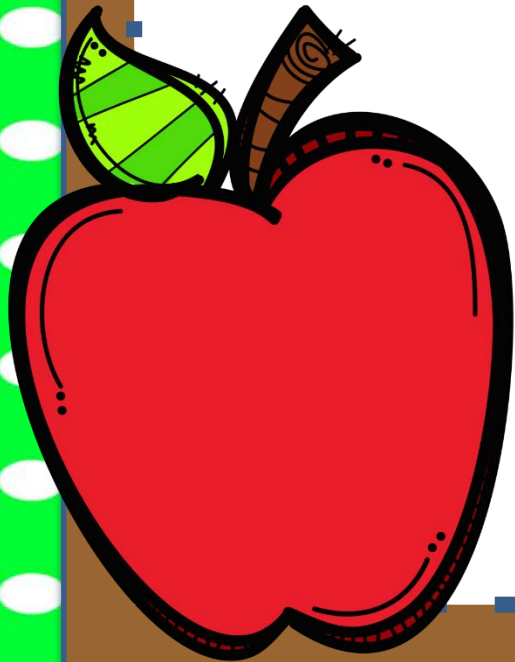


TWELVE DAY  
UNIT!

# Expressions and Equation Unit

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This is a 12 day unit on Expressions and Equations. Each day has a Power Point that includes a warm-up with answers, notes, and a closure of the lesson. Guided notes or flippables are provided for each lesson as well as an activity and a practice sheet.

### Day One- Writing Expressions and Equations

Translate words into expressions and equations.

- Warm Up in Power Point
- Writing Expressions and Equations Flippable –Notes for the flippable are provided in the Power Point, students can make their own or you can have them use the printable provided.
- Writing Expressions and Equations Dominoes
- Writing Expressions and Equations Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Two-Adding Like Terms

Identify like terms and add them.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Adding Like Terms Flippable –Directions and notes for the flippable are provided in the Power Point, students can make their own or you can have them use the printable provided.
- Notes –Instead of using the flippable, students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Adding Like Terms Connect Game
- Adding Like Terms Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

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## Day Three- Distributive Property

Use the distributive property to write equivalent algebraic expressions.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Distributive Property Matching Game
- Distributive Property Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Four- Simplifying Expressions

**Simplify algebraic expressions.**

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Simplifying Expressions Coloring Sheet
- Simplifying Expressions Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Five- One-Step Equations with Addition and Subtraction

Solve one-step equations using the addition and subtraction properties of equality.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- One-Step Equation Pairs Check
- One-Step Equation Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

Day Six- One-Step Equations with Multiplication and Division

Solve one-step equations using the multiplication and division properties of equality.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- One-Step Equation Square Puzzle
- One-Step Equation Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Seven-Two -Step Equations

Solve two-step equations.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Two-Step Equation Bingo-Students can create their own 5x5 grid or you can use the one provided. They should put all 25 numbers found in the power point on their board. They will not have a free space. Use the sheet provided to call out the problems in any order. Put a check in the blank after you have called the problem. The answers are provided beside the problem.
- Two-Step Equation Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

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## Day Eight -Equations with Decimals

Solve equations with decimals.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes -Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Equations with Decimals Tic-Tac-Toe.
- Equations with Decimals Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Nine –Equations with Fractions

**Solve equations with fractions.**

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Equations with Fractions Pairs Work
- Equations with Fractions Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

## Day Ten – Multi-Step Equations

Solve multi-step equations.

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Notes –Students can take notes by writing in their notebooks or you can provide them a copy of the guided notes.
- Multi-Step Equations Coloring Sheet
- Multi-Step Equations Worksheet- can be used as practice or homework
- Closure-can be used as an exit ticket

### Day Eleven- Expressions and Equations Test Review

- Warm Up in Power Point-You can use this as a review or a quiz of the previous day's lesson.
- Expressions and Equations Square Game
- Things to know for your Expressions and Equations Test- Students can copy this from the power point or you can run off the printable provided.

### Day Twelve- Expressions and Equations Test

- Expressions and Equations Test

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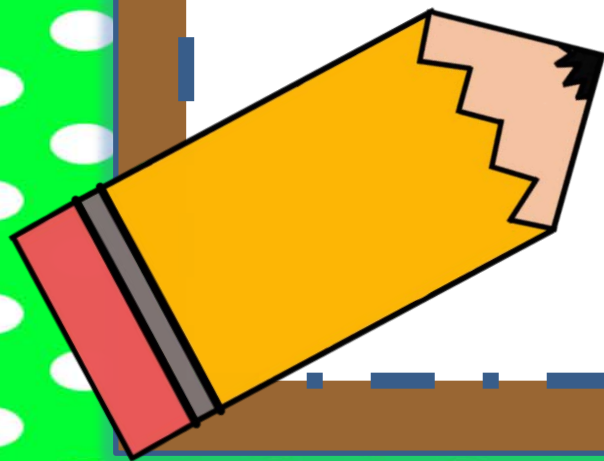
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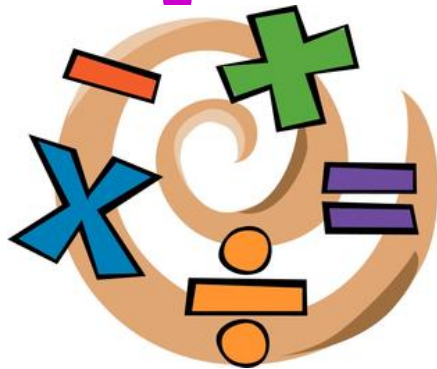
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# Writing Expressions and Equations



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# Warm Up

1). Solve the following expression  $y^2 + x \div 2$   
for  $x = -16$  and  $y=9$  **73**

2). Evaluate.

**-2** a).  $-9 - (-7)$

b).  $-8 + 7 - 3$  **-4**

**3** c).  $9 \div (-3)(-1)$

d).  $-\frac{1}{2}(100)$  **-50**

3). While playing football Paul's team gained 5 yards on the first play, lost 6 yards on the 2<sup>nd</sup> play and gained 2 yards on the third play. What was the result of the first three plays?  
 **$5 + -6 + 2 = 1$  yard**



Expression- A mathematical phrase that has operations, numbers and/or variables. Expressions do not have an equal sign.

**Example:**       $1 + 3$                $3 + a$                $2y^2 - 7(8)$

Equation- A mathematical sentence that shows two expressions are equal.

**Examples:**       $2 + 3 = 5$                $x + 3 = 6$                $2t = 25$

# Flippable

## Writing Expressions and Equations

Words for  
Addition

Words for  
Subtraction

Words for  
Multiplication

Words for  
Division

## Addition

add

plus

sum

more than

increased by

total

in all

## Subtraction

take away

minus

difference

less than

subtract

decreased by

## Multiplication

times

product

multiplied

each

of

## Division

divided by

quotient

separated into

per

half

# Writing Expressions Examples

Write each phrase as an expression.

1). The sum of 6 and a number.

$$6 + x \text{ (any letter is fine)}$$

2). Ten less than a number  $x$ .

$$x - 10$$

3). The sum of 6 times a number and 7.

$$6y + 7$$

(any letter is fine)

4). Eight times the sum of  $y$  and six.

$$8(y+6)$$

5). Five notebooks that cost \$0.75 each and 6 pencils.

$$5(0.75) + 6y \text{ (any letter is fine) or } \$3.75 + 6y$$

# Writing Equations Examples

Write each sentence as an equation.

1). The sum of three times a number and six is seven.

$$3X + 6 = 7$$

2). The product of 6 and y is 42.

$$6y=42$$

3). Jake's age divided by 3 equals ten.

$$\frac{j}{3} = 10$$

4). Two more than the number of dogs is 18.

$$D+ 2 = 18$$

5). Ten pounds less than twice her weight is 90.

$$2W-10= 90$$

## Practice

Write each as an expression or equation.

1). Ike's weight divided by 2.

$$I \div 2 \text{ or } \frac{i}{2}$$

2). Two times a number plus six equals 16.

$$2x + 6 = 16$$

3). The quotient of 16 and  $y$  is 8.

$$16 \div y = 8 \text{ or } \frac{16}{y} = 8$$

4). Three less than a number times six.

$$6x - 3$$

5). Jeff purchased 7 gumballs for \$0.25 each and 3 pieces of gum. He spent a total of \$2.05. How much did each piece of gum cost? Write the equation for this problem.

$$7(0.25) + 3x = \$2.05 \text{ or } \$1.75 + 3x = \$2.05$$

# Closure

Write the following expression in words three different ways.

$$2x + 3$$





Give around this side of the  
flippable and attach to your INB.

Fold on the solid line and cut on  
the dashed lines.

## Writing Expressions and Equations

Words for  
Addition

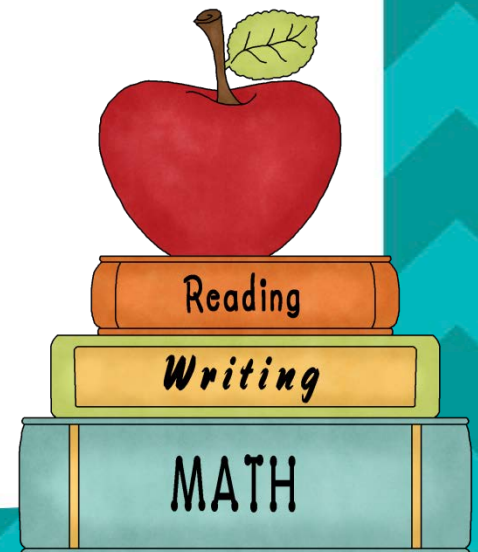
Words for  
Subtraction

Words for  
Multiplication

Words for  
Division

# Writing Expressions and Equations Dominoes

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The right side has an expression or equation in words and the left side has the answer. Students find the "Start" domino and continue matching until they reach the "End" domino. You can have students work on these individually, in pairs or in groups.

**Start**

Two more than a number.

$$X+2$$

Jon's age decreased by seven.

$$a - 7$$

The quotient of a number and 12.

$$x \div 12$$

A number times 6 is 33.

$$6y = 33$$

Fifteen less than a number.

$$p - 15$$

The product of 7 and a number is 54.

$$7x = 54$$

Six less than a number.

$$j - 6$$

Two more than a number is 15.

$$x + 2 = 15$$

The difference of 7 and a number.

$$7 - p$$

Kim's weight increased by 15.

$$w + 15$$

Thirteen divided by a number is 20.

$$13 \div x = 20$$

Half of Lou's height.

$$h \div 2$$

The sum of  
2 times a  
number and  
six is 78.

$$2x + 6 = 78$$

Fifteen  
plus a  
number  
is 4.

$$15 + u = 4$$

The  
product  
of 2 and  
a number  
increased  
by 6.

$$2(x + 6)$$

Joe's test  
grade  
plus 10 is  
90.

$$x + 10 = 90$$

A  
number  
divided  
by 7 is  
45.

$$y \div 7 = 45$$

The  
product  
of 8 and a  
number is  
15.

$$8x = 15$$

The sum  
of 15 and  
a number.

$$15 + y$$

The  
quotient  
of 2 and  
a number.

$$2 \div r$$

The  
difference  
of 6 and a  
number.

$$6 - j$$

Twelve  
times a  
number  
is 50.

$$12x = 50$$

The  
product  
of 5 and  
a number  
increased  
by 5.

$$5y + 5$$

**End**

## Writing Expressions and Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Write each as an expression or equation.

1). June added 6 seashells to her collection.

2). Three increased by the quotient of 6 and a number.

3). Thirteen less than a number is 70.

4). Ian's age decreased by 7 is 18.

5). Ten less than the product of a number and 4.

6). Five times the sum of a number and 6 is 56.

7). Jenna's allowance was doubled.

8). Eva paid \$16 for some notebooks and a backpack. She paid \$1.25 for 5 notebooks. How much did she pay for her backpack? Write the equation.

9). Tom paid \$16 for 4 pounds of jelly beans. How much did he pay for each pound? Write the expression.

10). Emma weighs half as much as Sonya. Sonya weighs 120 pounds. How much does Emma weigh? Write the expression.

## Writing Expressions and Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Write each as an expression or equation.

1). June added 6 seashells to her collection.

$$C + 6$$

2). Three increased by the quotient of 6 and a number.

$$6 \div y + 3 \text{ or } \frac{6}{y} + 3$$

3). Thirteen less than a number is 70.

$$x - 13 = 70$$

4). Ian's age decreased by 7 is 18.

$$A - 7 = 18$$

5). Ten less than the product of a number and 4.

$$4x - 10$$

6). Five times the sum of a number and 6 is 56.

$$5(x + 6) = 56$$

7). Jenna's allowance was doubled.

$$2a$$

8). Eva paid \$16 for some notebooks and a backpack. She paid \$1.25 for 5 notebooks. How much did she pay for her backpack? Write the equation.

$$5(1.25) + b = 16 \text{ or } 6.25 + b = 16$$

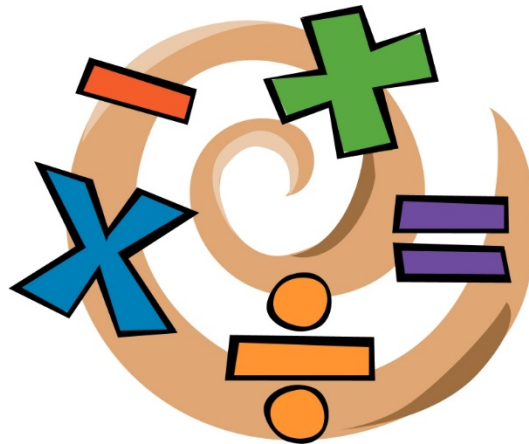
9). Tom paid \$16 for 4 pounds of jelly beans. How much did he pay for each pound? Write the expression.

$$16 \div 4 \text{ or } \frac{16}{4}$$

10). Emma weighs half as much as Sonya. Sonya weighs 120 pounds. How much does Emma weigh? Write the expression.

$$120 \div 2 \text{ or } \frac{120}{2}$$

# Adding Like Terms



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# Warm Up

Write each expression or equation.

1). The sum of two times a number and 6 equals 57.

$$2x + 6 = 57$$

2). Will's weight decreased by 4.

$$W - 4$$

3). The quotient of 76 and a number is 152.

$$\frac{76}{x} = 152 \text{ or } 76 \div x = 152$$

4). Rikki's allowance increased by 6 is 20 dollars.

$$A + 6 = 20$$

5). The product of 16 and the sum of a number and 5.

$$16(y + 5)$$

# Adding Like Terms Flippable

Like Terms	Unlike Terms	Combining Like Terms
---------------	-----------------	----------------------------

# Like Terms

Terms whose variables (including exponents) are the same.

Examples of Like Terms:

$-7x$                        $-84y^2$                        $11xy$   
 $2x, -10x, x$      $-8y^2, -76y^2$      $4xy, 7xy$

You can add like terms to make one term. You must use your integer rules when you have negative coefficients.

Remember only the variables have to be the same. The coefficients ( the number you multiply the variable by) do not have to be the same.

# Unlike Terms

Terms that do not have the same variables.

Examples of Unlike Terms:

$3z$  and  $4x$

$-7y^2$  and  $3y$

You cannot add these terms  
because they are not like terms.

## Combining Like Terms in Expressions

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

In this expression there are only 2 like terms. We can combine  $4x$  and  $-6x$ . We cannot add anything to  $7y$  or  $7$ .

Example 1:  $4y^2 + 5y - 9 + 3y^2 - 10$

Combine like terms  $4y^2 + 5y - 9 + 3y^2 - 10$

$$7y^2 + 5y - 19$$

Example 2:  $-7x^2 + k - 10 - k$

$$-7x^2 + k - 10 - k$$

$$-7x^2 - 10$$

## Practice

Add like terms.

1).  $3y + 7x - 2 - 3y + 9$

$$7x + 7$$

2).  $7k^3 + 9k^2 - 15 + 3k^2$

$$7k^3 + 12k^2 - 15$$

3).  $6h - 13j + 6h - 14 + 15j + 2$

$$12h + 2j - 12$$

4).  $20 - \frac{1}{2}y + 14 - \frac{2}{5}y$

$$-\frac{9}{10}y + 34$$

# Closure

List 3 terms that are alike and explain how you know they are alike. List 3 unlike terms and explain how you know they are not alike.





This side should be facing your notebook and will not be seen.

Cut flippable on dotted lines. Fold flippable on the solid line.

**Like  
Terms**

**Unlike  
Terms**

**Combining  
Like  
Terms**

## Connect Game

Materials: two dice, two different colored cubes or markers

### Directions:

- 1). Determine who goes first.
- 2). Player 1 rolls both dice. Go to the box that corresponds to your roll. For example, if you roll a 1 and 3 you can go to box 1, 3 or 3, 1. Player 1 solves the problem in the box. If you are correct, place your color marker in the box. If player 1 is incorrect, player 2 places their color marker in the box.
- 3). Next Player 2 rolls and solves their problem. The player that gets 4 in a row horizontally, vertically or diagonally first is the winner.

### Notes:

If you roll a box that has been claimed you lose your turn.

If you roll a 6 you lose your turn.

# Adding Like Terms Connect Game

	1	2	3	4	5
1	$-4x^2 + 5x$	$-19y - (-4y)$	$10k^3 - 2k^3$	$6 + (-7x) + 4$	$-6b + (-3b) + 3$
2	$8x - 4 + 18x$	$-7b + 5b$	$10c - 17$	$-4 + 14p - 9$	$-5x - 7x$
3	$-12y + (-12) + 10y$	$-5p - 8p^2$	$-14k + 25k$	$89s^4 - 99s^4$	$63b + (-100)$
4	$13k - 12k + 9$	$-144x + (-246x)$	$5 + 7y - 63$	$-90u + 65u$	$-77x^2 - 56x^3$

# Adding Like Terms Connect Game

	1	2	3	4	5
1	$-4x^2 + 5x$ $-4x^2 + 5x$	$-19y - (-4y)$ $-15y$	$10k^3 - 2k^3$ $8k^3$	$6 + (-7x) + 4$ $-7x + 10$	$-6b + (-3b) + 3$ $-9b + 3$
2	$8x - 4 + 18x$ $26x - 4$	$-7b + 5b$ $-2b$	$10c - 17$ $10c - 17$	$-4 + 14p - 9$ $14p - 13$	$-5x - 7x$ $-12x$
3	$-12y + (-12) + 10y$ $-2y - 12$	$-5p - 8p^2$ $-5p - 8p^2$	$-14k + 25k$ $11k$	$89s^4 - 99s^4$ $-10s^4$	$63b + (-100)$ $63b + (-100)$
4	$13k - 12k + 9$ $k + 9$	$-144x + (-246x)$ $-390x$	$5 + 7y - 63$ $7y - 58$	$-90u + 65u$ $-25u$	$-77x^2 - 56x^3$ $-77x^2 - 56x^3$

## Adding Like Terms Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Add all like terms. Use colored pencils to show all like terms.

1).  $6x - 25x$

2).  $-36x^3 - 7y + x^3$

3).  $56m + (-2) - 67m + 6$

4).  $-336k - 4k + 7$

5).  $9y^2 - 5 + 8y - 12y^2$

6).  $27 + 12x$

7).  $9y - 9y$

8).  $-98 + 86n - 76n + 70$

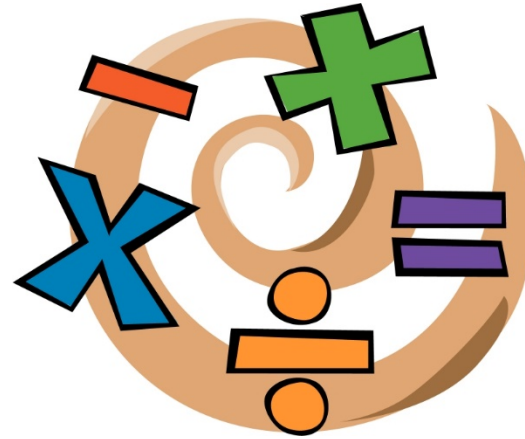
## Adding Like Terms Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Add all like terms. Use colored pencils to show all like terms.

1). $6x - 25x$  $-19x$	2). $-36x^3 - 7y + x^3$  $-35x^3 - 7y$
3). $56m + (-2) - 67m + 6$  $-11m+4$	4). $-336k - 4k + 7$  $-340k+7$
5). $9y^2 - 5 + 8y - 12y^2$  $-3y^2 + 8y - 5$	6). $27 + 12x$  $27+12x$
7). $9y - 9y$  $0$	8). $-98 + 86n - 76n + 70$  $10n-28$

# Distributive Property



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# Warm Up

Add like terms.

$$1). \quad 6j + 8 - 17j^2 - 8j + 9 \quad -17j^2 - 2j + 17$$

$$2). \quad -19x + 8x + 19x \quad 8x$$

$$3). \quad \frac{1}{5}f + 67 - \frac{3}{5}f \quad -\frac{2}{5}f + 67$$

$$4). \quad -9x^3 - x + 56x^3 + 6x^2 \quad 47x^3 + 6x^2 - x$$



## The Distributive Property

$$a(b + c) = ab + ac$$

$$(b + c)a = ba + ca$$

To multiply a number by a sum, multiply each number inside the parentheses by the number outside the parentheses.

Example 1:  $2(6 + 4) = 2 \times 6 + 2 \times 4$   
 $12 + 8$   
 $= 20$

Example 2:  $2(x + 3)$   
 $2(x) + 2(3)$   
 $= 2x + 6$

Example 3:  $2(x - 1)$   
 $2(x) - 2(1)$   
 $= 2x - 2$

## Practice

Use the Distributive Property to evaluate each expression.

1).  $4(5 + 7)$

$20 + 28 = 48$

2).  $-2(4 + 3)$

$-8 + -6 = -14$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

3).  $3(x + 4)$       $3x+12$

4).  $-7(y - 3)$       $-7y+21$

5).  $(2m + 6)2$       $4m + 12$

# Closure

Explain what the distributive property is and give an example.

## The Distributive Property Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

### The Distributive Property

$$a(b + c) = ab + ac$$

$$(b + c) = ba + ca$$

To multiply a number by a sum, multiply each number inside the parentheses by the number outside the parentheses.

Example 1:  $2(6+4)$

Example 2:  $2(x + 3)$

Example 3:  $2(x - 1)$

### Practice

Use the Distributive Property to evaluate each expression.

1).  $4(5 + 7)$


2).  $-2(4 + 3)$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

3).  $3(x + 4)$

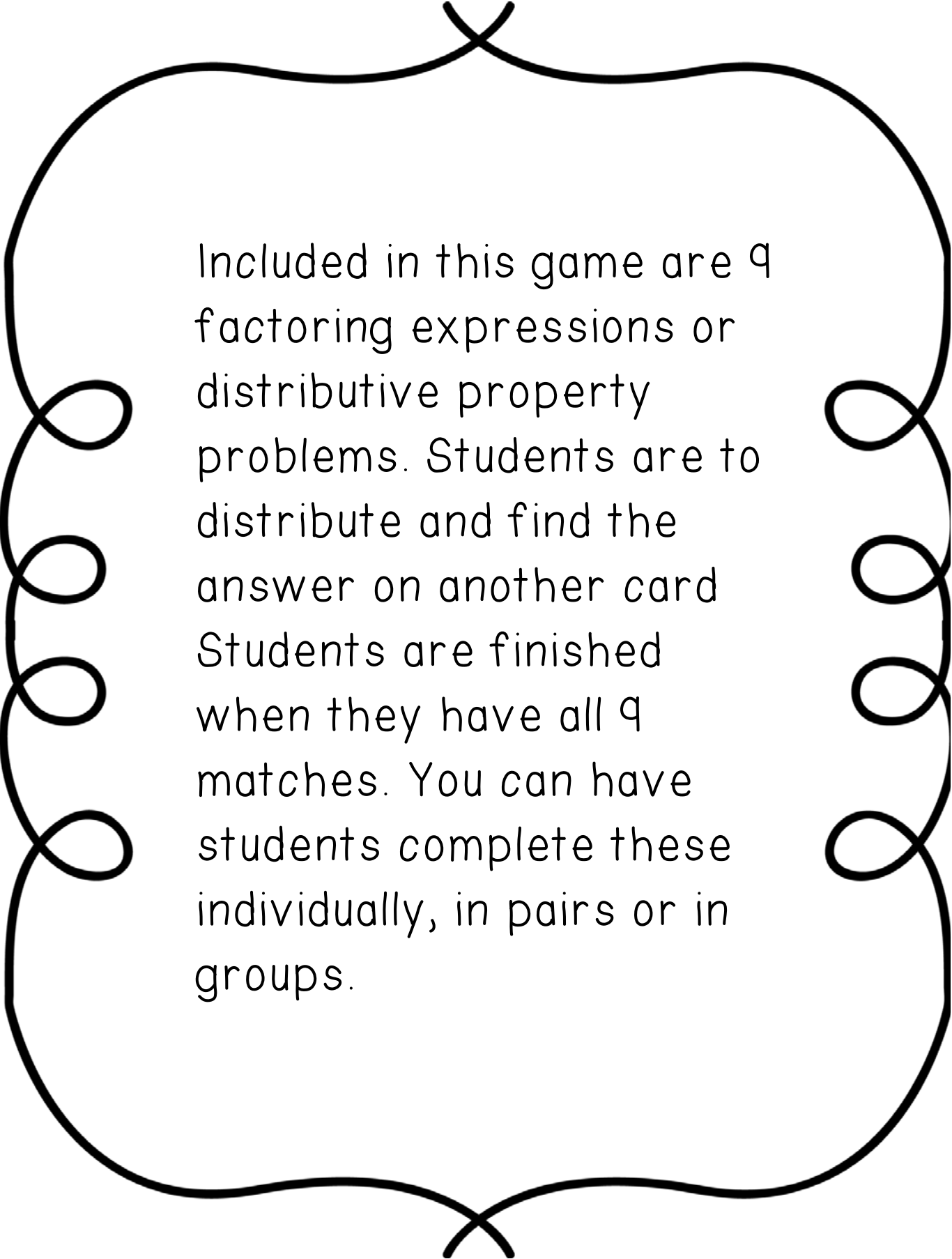
4).  $-7(y - 3)$

5).  $(2m + 6)2$



Distributive  
Property  
Matching  
Game

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Included in this game are 9 factoring expressions or distributive property problems. Students are to distribute and find the answer on another card. Students are finished when they have all 9 matches. You can have students complete these individually, in pairs or in groups.

$$3(x+3)$$

$$-3(x+3)$$

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

$$3(x-3)$$

$$-3(x-3)$$

$$-4(x-3)$$

$$5(2x-10)$$

$$-5(x+2)$$

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



$$3x+9$$

$$-3x-3$$

$$-4x+20$$

$$3x - 9$$

$$-3x+9$$

$$-4x+12$$

$$10x - 50$$

$$-5x - 10$$

$$-12x+12$$

# Distributive Property Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Use the Distributive Property to evaluate each expression.

1).  $3(1 + 5)$  \_\_\_\_\_

2).  $-9(4 + 2)$  \_\_\_\_\_

3).  $-20(-5 - 7)$  \_\_\_\_\_

4).  $(4 - 9)2$  \_\_\_\_\_

Use the Distributive Property to write each expression as an equivalent algebraic expression.

5).  $-3(x + 14)$  \_\_\_\_\_

4).  $-4(y - -13)$  \_\_\_\_\_

5).  $(m - 6)8$  \_\_\_\_\_

6).  $16(2y^2 + 4)$  \_\_\_\_\_

7).  $-8(k - 9)$  \_\_\_\_\_

8).  $14(-x + 2)$  \_\_\_\_\_

9).  $6(t - 4)$  \_\_\_\_\_

10). Write the expression and simplify it.

Fifteen times the difference of a number and 6.

# Distributive Property Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Use the Distributive Property to evaluate each expression.

1).  $3(1 + 5)$        $3(1) + 3(5) = 18$

2).  $-9(4 + 2)$        $-9(4) + -9(2) = -54$

3).  $-20(-5 - 7)$        $-20(-5) + 140 = 240$

4).  $(4 - 9)2$        $4(2) - 9(2) = -10$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

5).  $-3(x + 14)$        $-3x - 42$

4).  $-4(y - -13)$        $-4y - 52$

5).  $(m - 6)8$        $8m - 48$

6).  $16(2y^2 + 4)$        $32y^2 + 64$

7).  $-8(k - 9)$        $-8k + 72$

8).  $14(-x + 2)$        $-14x + 28$

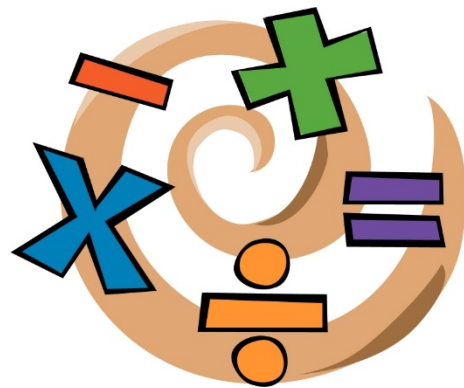
9).  $6(t - 4)$        $6t - 24$

10). Write the expression and distribute.

Fifteen times the difference of a number and 6.

$15(x-6)$        $15x-90$

# Simplifying Expressions



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# Warm Up

Use the Distributive Property to evaluate each expression.

1).  $2(3 + 4)$   $6+8=14$  2).  $-(9 - 4)$   $-9+4= -5$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

3).  $6(j + 14)$   $6j + 84$

4).  $-3(2y + 10)$   $-6y-30$

5).  $(12m - 6)3$   $36m-18$

An **algebraic expression** is in simplest form if it has no like terms and no parentheses.

Example 1:  $3x - 5 - 8x + 6$   
 $3x - 5 - 8x + 6$   
 $-5x + 1$

Example 2:  $m + 3(n + 4m)$   
 $m + 3n + 12m$   
 $m + 3n + 12m$   
 $13m + 3n$

There are not any parentheses so we do not have to distribute. Next we look for like terms and add them. Now the expression is simplified.

Since we have parentheses we have to distribute first.

After distributing add your like terms. Now the expression is simplified.

## Practice

1).  $9y + 8 - 8$        $9y$

2).  $2x - 5 - 4x + 8$        $-2x+3$

3).  $5 - 3(y + 7)$        $-3y-16$

4).  $3x + 2y + 4y$        $3x+6y$

5).  $x + 3(x + 4y)$        $4x+12y$

# Closure

Explain how you would solve this problem.

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



## Simplifying Expressions Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

### Algebraic Expression-

Example 1:  $3x - 5 - 8x + 6$

Example 2:  $m + 3(n + 4m)$

### Practice

1).  $9y + 8 - 8$

2).  $2x - 5 - 4x + 8$

3).  $5 - 3(y + 7)$

4).  $3x + 2y + 4y$

5).  $x + 3(x + 4y)$

## Simplifying Expressions Color by Number

Name \_\_\_\_\_ Date \_\_\_\_\_

1).  $2p^2 + 3p - 4 + 2p^2 + 6p + 6$  \_\_\_\_\_

How many  $p^2$ 's are there? \_\_\_\_\_ Color all of the spaces with this number yellow.

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

How many  $x^2$ 's are there? \_\_\_\_\_ Color all of the spaces with this number yellow green.

3).  $4x - 2 + 3x - 4x + 10$

How many whole numbers (units) are there? \_\_\_\_\_ Color all of the spaces with this number red/orange.

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

How many  $x^2$ 's are there? \_\_\_\_\_ Color all of the spaces with this number blue.

5).  $5x^2 + 6x + 5 + x + 7$

How many  $x$ 's are there? \_\_\_\_\_ Color all of the spaces with this number orange.

6).  $(2x + 3) + 2(4x + 1)$

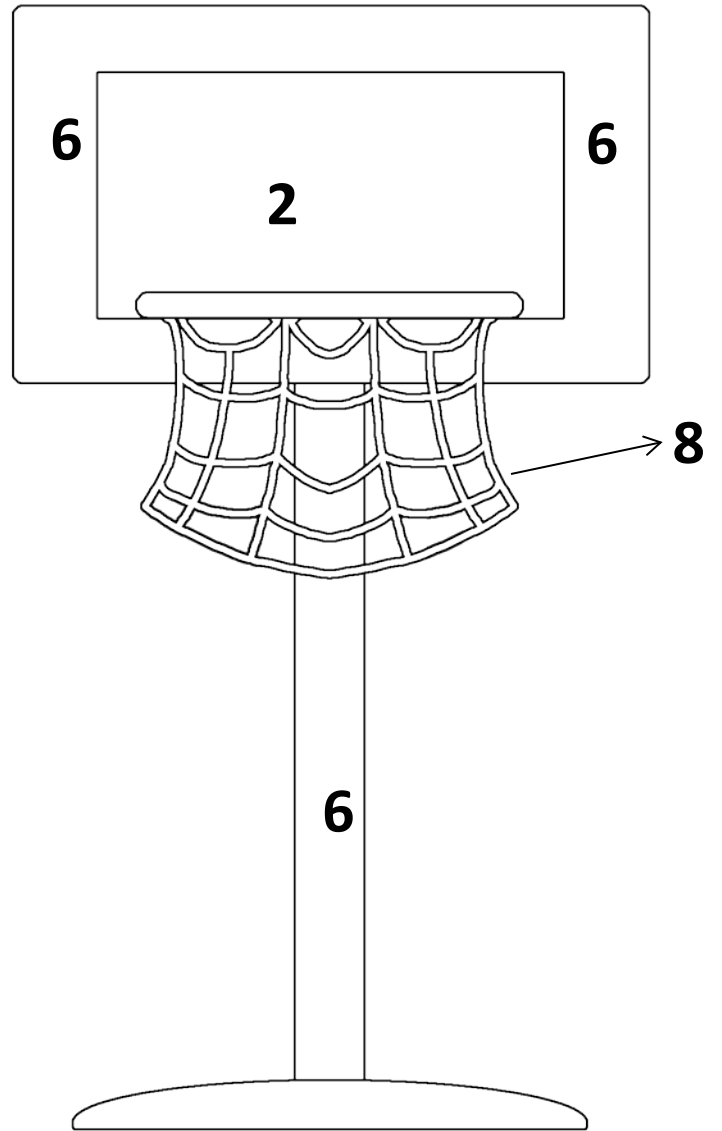
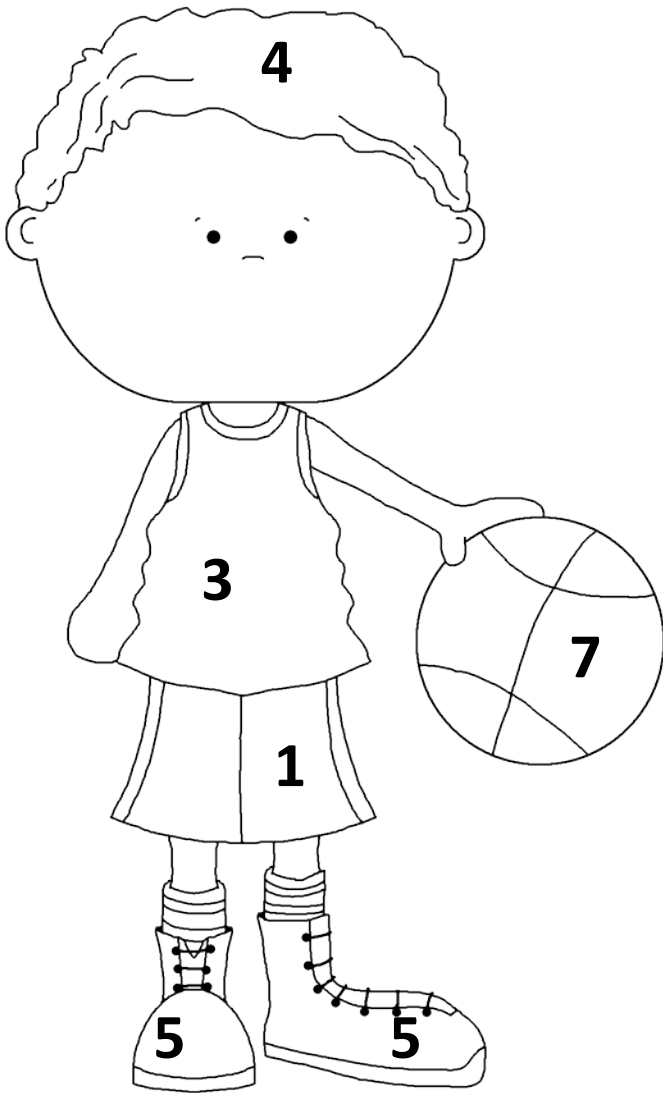
How many whole numbers (units) are there? \_\_\_\_\_ Color all of the spaces with this number brown.

7).  $10y^2 + 5y + 2 + 3y^2 - 2y$

How many  $y$ 's are there? \_\_\_\_\_ Color all of the spaces with this number green.

8).  $3x^2 + 6 + 2x^2 + 3x + x^2$

How many  $x^2$ 's are there? \_\_\_\_\_ Color all of the spaces with this number yellow orange.



## Simplifying Expressions Color by Number

Name \_\_\_\_\_ Date \_\_\_\_\_

1).  $2p^2 + 3p - 4 + 2p^2 + 6p + 6$   $4p^2 + 9p + 2$

How many  $p^2$ 's are there?  $\underline{4}$  \_\_\_\_\_ Color all of the spaces with this number yellow.

2).  $6(x + 2) + 3x + 2x^2$   $2x^2 + 9x + 12$

How many  $x^2$ 's are there?  $\underline{2}$  \_\_\_\_\_ Color all of the spaces with this number yellow green.

3).  $4x - 2 + 3x - 4x + 10$   $3x + 8$

How many whole numbers (units) are there?  $\underline{8}$  \_\_\_\_\_ Color all of the spaces with this number red/orange.

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

How many  $x^2$ 's are there?  $\underline{1}$  \_\_\_\_\_ Color all of the spaces with this number blue.

5).  $5x^2 + 6x + 5 + x + 7$   $5x^2 + 7x + 12$

How many  $x$ 's are there?  $\underline{7}$  \_\_\_\_\_ Color all of the spaces with this number orange.

6).  $(2x + 3) + 2(4x + 1)$   $10x + 5$

How many whole numbers (units) are there?  $\underline{5}$  \_\_\_\_\_ Color all of the spaces with this number brown.

7).  $10y^2 + 5y + 2 + 3y^2 - 2y$   $13y^2 + 3y + 2$

How many  $y$ 's are there?  $\underline{3}$  \_\_\_\_\_ Color all of the spaces with this number green.

8).  $3x^2 + 6 + 2x^2 + 3x + x^2$   $6x^2 + 3x + 6$

How many  $x^2$ 's are there?  $\underline{6}$  \_\_\_\_\_ Color all of the spaces with this number yellow orange.

## Simplifying Expressions Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Simplify each expression.

1).  $3p + 14q^2 + p$  \_\_\_\_\_

2).  $2x^2 - 3x^2 - 4 + 6$  \_\_\_\_\_

3).  $x^3 + 4x^3 + 3n - n$  \_\_\_\_\_

4).  $5a + 6b + 3 - a - 5b + 1$  \_\_\_\_\_

5).  $5h^2 + 3j + 7h^2 + 4 - 3j$  \_\_\_\_\_

6).  $4(r + 6) - 10 + 2r$  \_\_\_\_\_

7).  $-2(x + 2) + 4(3 + 2x)$  \_\_\_\_\_

8).  $6(x - 4) + 3x - 20$  \_\_\_\_\_

9).  $6(r - 4) + 3r + 10 - 4r$  \_\_\_\_\_

10).  $6h + 4 - 2h + 14 - 5h$  \_\_\_\_\_

## Simplifying Expressions Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Simplify each expression.

1).  $3p + 14q^2 + p$   $14q^2 + 4p$

2).  $2x^2 - 3x^2 - 4 + 6$   $-x^2 + 2$

3).  $x^3 + 4x^3 + 3n - n$   $5x^3 + 2n$

4).  $5a + 6b + 3 - a - 5b + 1$   $4a + b + 4$

5).  $5h^2 + 3j + 7h^2 + 4 - 3j$   $12h^2 + 4$

6).  $4(r + 6) - 10 + 2r$   $6r + 14$

7).  $-2(x + 2) + 4(3 + 2x)$   $6x + 8$

8).  $6(x - 4) + 3x - 20$   $9x - 44$

9).  $6(r - 4) + 3r + 10 - 4r$   $5r - 14$

10).  $6h + 4 - 2h + 14 - 5h$   $-h + 18$

# One-Step Equations with Addition and Subtraction

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# Warm Up

Simplify each expression.

1).  $2p + 22q^2 - p$

$$22p^2 + p$$

2).  $5(r + 9) - 5$

$$5r + 40$$

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

$$4x^2 + 10x + 4$$

4).  $2h^2 + 3g - 2h^2 + 4 - 3 + 4g$

$$7g + 1$$

5).  $-7(x - 4) + 3w - 27$

$$-7x + 3w + 1$$



**Equation**- A mathematical sentence that contains an equal sign. To solve an equation you need to isolate the variable.

### Properties of Equality

Addition- You can add the same value to each side of an equation and the sides will remain equal.

Subtraction- You can subtract the same value from each side of an equation and the sides will remain equal.

$$\text{Ex. 1: } x + 2 = -14$$

$$\begin{array}{r} - 2 \quad -2 \\ \hline x = -16 \end{array}$$

You use the subtraction property of equality to subtract 2 from both sides in order to get the "y" by itself.

$$\text{Ck: } -16 + 2 = -14$$

$$-14 = -14$$

To check to see if your answer is correct, substitute the x in your equation with the -16. Solve the equation. If it is true then the value for x is correct.

$$\begin{array}{r} \text{Ex. 2: } y - 6 = 10 \\ \quad \quad \quad +6 \quad \quad +6 \\ \hline \quad \quad \quad x = 16 \end{array}$$

You use the addition property of equality to add 6 to both sides in order to get the "y" by itself.

$$\begin{array}{r} \text{Ck: } 16 - 6 = 10 \\ \quad \quad \quad \checkmark 10 = 10 \end{array}$$

To check to see if your answer is correct, substitute the x in your equation with the 16. Solve the equation. If it is true then the value for x is correct

## Practice

Solve and check.

1).  $x - 4 = -7$   $x = -3$

2).  $x - 3 = 15$   $x = 18$

3).  $x - (-4) = 4$   $x = 0$

4).  $3 = a + (-5)$   $a = 8$

5).  $-14 + n = 5$   $n = 19$

# Closure

Write the equation for the problem and solve it.

Jackie has 50 football cards now because his friend Jacob gave him 20 cards. How many football cards did his friend give him?

$$X + 20 = 50 \quad x = 30$$

He gave him 30 cards.

One-Step Equations with Addition and Subtraction Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

Equation-

Addition Property of Equality-

Subtraction Property of Equality-

Example 1:  $x + 2 = -14$

Example 2:  $y - 6 = 10$

Practice Solve and check.

1).  $x - 4 = -7$

2).  $x - 3 = 15$

3).  $x - (-4) = 4$

4).  $3 = a + (-5)$

5).  $-14 + n = 5$

## Pairs Work

1. Partners work on a worksheet. One student works on the problem while the other watches and helps, if necessary.
2. The partner checks the work for agreement. If the partners don't agree on the answer, they may ask the other pair on the team. If the team as a whole cannot agree on the answer, the team asks the teacher for help.
3. Partners switch roles.
4. Team meets to compare answers. If they disagree they are to raise their hands.



# One-Step Equations with Addition and Subtraction Pairs Check

Name \_\_\_\_\_ Name \_\_\_\_\_

1).  $x + 8 = 12$

2).  $y + -3 = 8$

3).  $3 = n + 4$

4).  $x + (-4) = -7$

5).  $y + -10 = -25$

6).  $c + 9 = 37$

7).  $d - 4 = -7$

8).  $c - 34 = 20$

9).  $x - 3 = 8$

10).  $x - 4 = -10$



# One-Step Equations with Addition and Subtraction Pairs Check

Name \_\_\_\_\_ Name \_\_\_\_\_

1).  $x + 8 = 12$       $x=4$

$y=11$

2).  $y + -3 = 8$

3).  $3 = n + 4$       $n=-1$

$x=-3$

4).  $x + (-4) = -7$

5).  $y + -10 = -25$       $y=-15$

$c=28$

6).  $c + 9 = 37$

7).  $d - 4 = -7$       $d=-3$

$c=54$

8).  $c - 34 = 20$

9).  $x - 3 = 8$       $x=11$

$x=-6$

10).  $x - 4 = -10$

## One-Step Equations with Addition and Subtraction Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $6 + x = -25$

2).  $y - 36 = 7$

3).  $m + (-2) = 67$

4).  $-336 + k = 17$

5).  $p - 5 = -12$

6).  $c - (-12) = 48$

7). John had 9 pieces of gum at the beginning of the day. He now has 8 pieces of gum. How much gum did he eat during the day? Write the equation and the solution.

8). Kim paid \$98 for a pair of tennis shoes. She has \$70 left. How much money did she have before buying the shoes? Write the equation and the solution.

## One-Step Equations with Addition and Subtraction Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $6 + x = -25$

$X = -31$

2).  $y - 36 = 7$

$X = 43$

3).  $m + (-2) = 67$

$M = 69$

4).  $-336 + k = 17$

$K = 353$

5).  $p - 5 = -12$

$P = -7$

6).  $c - (-12) = 48$

$C = 36$

7). John had 9 pieces of gum at the beginning of the day. He now has 8 pieces of gum. How much gum did he eat during the day? Write the equation and the solution.

$9 - y = 8$

$Y = 1$

8). Kim paid \$98 for a pair of tennis shoes. She has \$70 left. How much money did she have before buying the shoes? Write the equation and the solution.

$w - 98 = 70$

$W = 168$

# One-Step Equations with Multiplication and Division

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# Warm Up

Solve and Check.

1).  $y - 6 = -23$   $Y = -17$

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

3).  $j + 20 = -54$   $J = -74$

4).  $m - (-2) = 23$   $M = 21$

5). Write the equation and solve.  $J + 10 = 24$   $j = 14$

Jack's age increased by 10 is 24.

To solve one-step equations with multiplication and division, you need to isolate the variable by using the multiplication and division properties of equality.

### Property of Equalities

**Multiplication**-You can multiply each side of an equation by the same value and the sides will remain equal.

**Division**- You can divide each side of an equation by the same value and the sides will remain equal.

Example 1:  $\frac{-12x}{-12} = \frac{24}{-12}$

$$x = -2$$

You use the division property of equality to divide both sides by -12 in order to get the "x" by itself.

Ck:  $-12(-2) = 24$   
 $\checkmark 24 = 24$

To check to see if your answer is correct, substitute the x in your equation with the -2. Solve the equation. If it is true then the value for x is correct.

Example 2:  $\frac{3x}{3} = \frac{36}{3}$

$$x = 12$$

Ck:  $3(12) = 36$

$$\sqrt{36} = 36$$

You use the division property of equality to divide both sides by 3 in order to get the "x" by itself.

To check to see if your answer is correct, substitute the x in your equation with the 12. Solve the equation. If it is true then the value for x is correct.



Example 3:  $\frac{8}{1} \cdot \frac{x}{8} = -9 \cdot 8$

$$x = -72$$

Ck:  $\frac{-72}{8} = -9$   
 $\checkmark -9 = -9$

You use the multiplication property of equality to multiply both sides by 8 in order to get the "x" by itself.

To check to see if your answer is correct, substitute the x in your equation with the 72. Solve the equation. If it is true then the value for x is correct.

Example 4:  $\frac{6}{1} \cdot \frac{x}{6} = 15 \cdot 6$

$x=90$

You use the multiplication property of equality to multiply both sides by 6 in order to get the "x" by itself.

Ck:  $\frac{90}{6} = 15$   
 $\checkmark 15 = 15$

To check to see if your answer is correct, substitute the x in your equation with the 90. Solve the equation. If it is true then the value for x is correct.

## Practice

Solve and Check.

1).  $5x = 95$  x=19

2).  $\frac{x}{-3} = 5$  x= -15

3).  $2x = -4$  x = -2

4).  $\frac{x}{8} = -3$  x = -24

# Closure

Write the equation and find the solution.

Kim bought seven candy bars. Her total bill was \$4.55. How much did each candy bar cost?

$$7x = 4.55 \quad x = 0.65$$

# One-Step Equations with Multiplication and Division Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

Multiplication Property of Equality-

Division Property of Equality-

Example 1:  $-12x = 24$

Example 2:  $3x = 36$

Example 3:  $\frac{x}{8} = -9$

Example 4:  $\frac{x}{6} = 15$

Practice Solve and check.

1)  $5x = 95$

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

3)  $2x = -4$

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

One-Step  
Equations with  
Multiplication  
and Division  
Square Puzzle



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Students can complete the puzzle individually, in pairs or in groups.

Give each student or group the cut out puzzle pieces. Students are to put the puzzle back together matching the problem with the answer. You can have students glue or tape the puzzle to a sheet a paper or you can check them at their desks.

# One-Step Multiplication and Division Square Puzzle

$16x = 144$ $X = 4$ $-7x = 49$ $\frac{x}{4} = 19$	$7 = X$ $X = 3$ $3x = -120$ $\frac{x}{5} = 16$	$2x = -12$ $X = -3$ $1 - \frac{x}{4} = -12$ $X = -40$
$X = -6$ $X = -132$ $X = -3$ $X = -76$	$-12x = 36$ $X = 16$ $X = -220$ $15x = 45$	$X = 48$ $X = 48$ $\frac{44}{5} = x$ $-100x = 1000$ $\frac{x}{3} = 56$
$116y = 232$ $X = -55$ $X = 48$ $\frac{x}{33} = -4$	$X = -28$ $\frac{21}{x} = 4$ $-16y = -256$ $X = -36$	$X = 168$ $X = 35$ $X = 168$ $-25x = 900$ $x = -15$



## One-Step Equations with Multiplication and Division Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $-6x = -24$

2).  $\frac{y}{9} = 7$

3).  $8m = -640$

4).  $\frac{k}{-4} = 17$

5).  $-2p = 12$

6).  $\frac{c}{13} = 48$

7). Kevin and his 8 friends made \$1080 mowing lawns this summer. How much money will each person get if they divide the money evenly? Write the equation and give the solution.

8). There are five bags with 98 chocolate drops in each one. How many chocolate drops are there in total? Write the equation and give the solution.

# One-Step Equations with Multiplication and Division Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $-6x = -24$   $x=4$

2).  $\frac{y}{9} = 7$   $y=63$

3).  $8m = -640$   $m= -80$

4).  $\frac{k}{-4} = 17$   $k= - 68$

5).  $-2p = 12$   $p= - 6$

6).  $\frac{c}{13} = 48$   $c= 624$

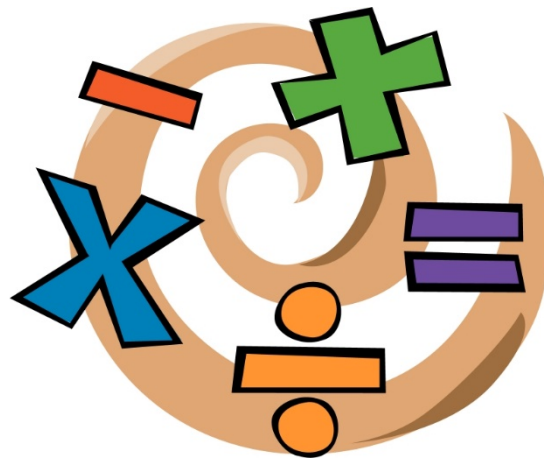
7). Kevin and his 8 friends made \$1080 mowing lawns this summer. How much money will each person get if they divide the money evenly?

$9y = 1080$   $y= 120$

8). There are five bags with 98 chocolate drops in each one. How many chocolate drops are there in total?

$\frac{m}{5} = 98$   $m = 490$

# Solving Two-Step Equations



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# Warm Up

Solve and Check.

1).  $-4x = 24$       $x = -6$

2).  $y + 5 = -200$       $y = -205$

3).  $w - 6 = 400$       $w = 406$

4).  $-\frac{x}{6} = -5$       $x = 30$

Step 1 - Undo addition or subtraction.

Step 2 - Undo multiplication or division.

Example 1:  $3x - 1 = 8$

$x=3$

$$\begin{array}{r} +1 \quad +1 \\ \hline 3x = 9 \\ \hline 3 \quad 3 \end{array}$$

Ck:  $3(3) - 1 = 8$

$$9 - 1 = 8$$

$$\checkmark 8 = 8$$

In order to get the "x" by itself, we need to get rid of the -1 and 3. We remove the -1 by adding 1 to each side. We remove the 3 by dividing each side by 3.

To check to see if your answer is correct, substitute the x in your equation with 3. Solve the equation. If it is true then the value for x is correct.

Example 2:  $-4x + 2 = 14$

$$\underline{\quad -2 \quad -2}$$

$$-4x = \underline{12}$$

$$\underline{-4 \quad -4}$$

$$x = -3$$

Ck:  $-4(-3) + 2 = 14$

$$12 + 2 = 14$$

$$\checkmark 14 = 14$$

In order to get the "x" by itself, we need to get rid of the 2 and -4. We remove the 2 by subtracting 2 from each side. We remove the -4 by dividing each side by -4.

To check to see if your answer is correct, substitute the x in your equation with -3. Solve the equation. If it is true then the value for x is correct.

Example 3:  $\frac{n}{3} + 2 = -6$

$$\frac{3}{1} \cdot \frac{n}{3} = -8 \cdot 3$$

$$N = -24$$

Ck:  $\frac{-24}{3} + 2 = -6$

$$-8 + 2 = -6$$

$$\checkmark -6 = -6$$

In order to get the "n" by itself, we need to get rid of the 2 and 3. We remove the 2 by subtracting 2 or adding -2 to each side. We remove the 3 by multiplying each side by 3.

To check to see if your answer is correct, substitute the "n" in your equation with -24. Solve the equation. If it is true then the value for "n" is correct.

## Practice

Solve and Check.

1).  $-2x - 3 = 9$        $x = -6$

2).  $2n + 3 = 11$        $n = 4$

3).  $\frac{n}{-5} - 2 = 8$        $n = -50$

4).  $\frac{x}{2} + 4 = 10$        $x = 12$



# Bingo

9	15	7
-162	-4	91
3	100	-11
66	1	36
-10	-243	12
-84	-5	-14
8	306	-19
1600	-2	-32
-9		

# Closure

Write the equation and solve.

The product of 3 and a number plus 8 is 140.

$$3x + 8 = 140 \quad x = 44$$

## Two-Step Equations Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

### How to Solve Two-Step Equations

1).

2).

Example 1:  $3x - 1 = 8$

Example 2:  $-4x + 2 = 14$

Example 3:  $\frac{n}{3} + 2 = -6$

Practice Solve and check.

1).  $-2x - 3 = 9$

2).  $2n + 3 = 11$

3).  $\frac{n}{-5} - 2 = 8$

4).  $\frac{x}{2} + 4 = 10$

# Two-Step Equation Bingo



\_\_\_\_\_  $13x - 6 = 111$  (9)

\_\_\_\_\_  $\frac{x}{3} + 3 = 8$  (15)

\_\_\_\_\_  $3x + (-9) = 12$  (7)

\_\_\_\_\_  $-\frac{y}{9} - 10 = 8$  (-162)

\_\_\_\_\_  $6x + 1 = -23$  (-4)

\_\_\_\_\_  $\frac{x}{7} + 7 = 20$  (91)

\_\_\_\_\_  $-27x - 43 = -124$  (3)

\_\_\_\_\_  $\frac{x}{5} - 8 = 12$  (100)

\_\_\_\_\_  $-10x + (-20) = 90$  (-11)

\_\_\_\_\_  $\frac{x}{3} - (-7) = 29$  (66)

\_\_\_\_\_  $-2x - (-17) = 15$  (1)

\_\_\_\_\_  $-\frac{x}{4} + 3 = -6$  (36)

\_\_\_\_\_  $-7x - (-8) = 78$  (-10)

\_\_\_\_\_  $-\frac{x}{9} - 1 = 26$  (-243)

\_\_\_\_\_  $37 + 6x = 109$  (12)

\_\_\_\_\_  $-\frac{x}{12} + 11 = 18$  (-84)

\_\_\_\_\_  $62 - 65x = 387$  (-5)

\_\_\_\_\_  $-\frac{x}{14} + 5 = 4$  (-14)

\_\_\_\_\_  $18x - 21 = 123$  (8)

\_\_\_\_\_  $-\frac{x}{3} + 100 = (-2)$  (306)

\_\_\_\_\_  $-5x + (-9) = 86$  (-19)

\_\_\_\_\_  $\frac{x}{8} + 100 = 300$  (1600)

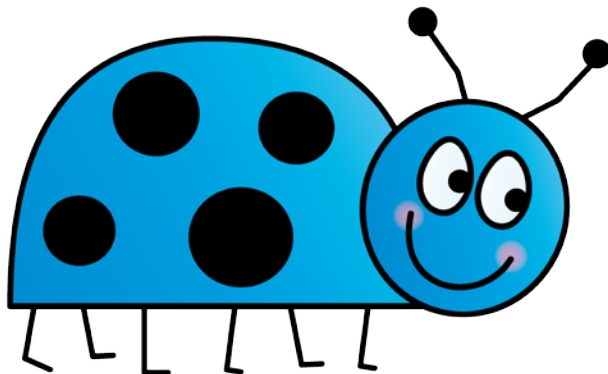
\_\_\_\_\_  $-121x + (-12) = 230$  (-2)

\_\_\_\_\_  $5 - \frac{x}{2} = 21$  (-32)

\_\_\_\_\_  $-15x - 9 = 126$  (-9)

# MATH BINGO

		<b>FREE SPACE</b>		



## Two-Step Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $7 + 2x = -25$

2).  $\frac{y}{3} - 36 = 7$

3).  $-4m + (-2) = 66$

4).  $-336 + \frac{k}{4} = 17$

5).  $7p - 5 = -12$

6).  $\frac{c}{8} - (-12) = 48$

7).  $9 - 2y = 18$

8). Joe paid \$6 for a pizza. He added 3 toppings. If he paid \$9 in total for the pizza, how much did each topping cost? Write the equation and give the solution.

## Two-Step Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $7 + 2x = -25$   $x = -16$

2).  $\frac{y}{3} - 36 = 7$   $y = 129$

3).  $-4m + (-2) = 66$   $m = -17$

4).  $-336 + \frac{k}{4} = 17$   $k = 1412$

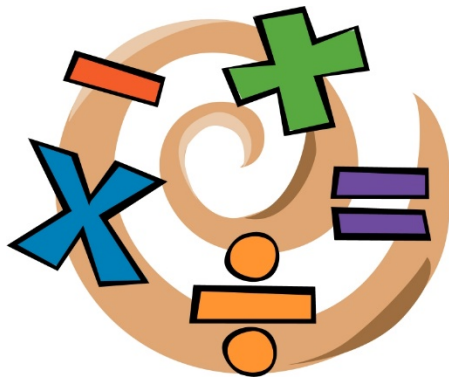
5).  $7p - 5 = -12$   $p = -1$

6).  $\frac{c}{8} - (-12) = 48$   $c = 288$

7).  $9 - 2y = 18$   $y = -4.5$

8). Joe paid \$6 for a pizza. He added 3 toppings. If he paid \$9 in total for the pizza, how much did each topping cost? Write the equation and give the solution.  
 $3x + 6 = 9$   $x = 1$

# Solving Equations with Decimals



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## Warm Up

Solve and Check.

1).  $-\frac{x}{2} + 7 = -98$   $X = 210$

2).  $6y - 6 = -12$   $Y = -1$

3).  $6 + \frac{k}{3} = -34$   $K = -120$

4).  $-5k + 3 = -7$   $K = 2$

5). Write the equation and find the solution.

Coffee costs \$0.75 for the first cup and \$0.15 for each refill. Ike spent \$1.20, how many refills did he get?  $0.15x + 0.75 = 1.20$   $X = 3$

## Reminder

You can solve an equation by using the equality properties to isolate the variable.

To solve equations with decimals you isolate the variable like you would an equation without decimals.

**Example 1:**      $y - 4.35 = 8.3$

$$+ \underline{4.35} \quad +4.35$$

$$y = 12.65$$

**Check:**  $12.65 - 4.35 = 8.3$

$$\sqrt{8.3 = 8.3}$$

**Example 2:**  $\frac{3.4}{1} \cdot \frac{x}{3.4} = -9.8 (3.4)$

**$X = -33.32$**

**Check:**  $\frac{-33.32}{3.4} = -9.8$   
 $\sqrt{-9.8} = -9.8$

**Example 3:**     $2.4x - 7.6 = 6.8$

$$\underline{+ 7.6} \quad \underline{+ 7.6}$$

$$\underline{2.4x} = \underline{6.8}$$

$$2.4 \quad 2.4$$

$$x = 6$$

**Check:**     $2.4(6) - 7.6 = 6.8$

$$14.4 - 7.6 = 6.8$$

$$\sqrt{6.8} = 6.8$$

## Practice

Solve and Check.

1).  $8.97 + x = -97.6$      $x = -106.57$

2).  $\frac{y}{2.5} - 9.7 = 64.3$      $y = 185$

3).  $-8.24x = -24.72$      $x = 3$

4).  $8.25y + 98 = 494$      $y = 48$

# Closure

Tell how these equations are alike and different.

$$2y + 8.2 = 16.8 \quad \text{and} \quad \frac{y}{7.8} - 9 = 8.7$$

## Equations with Decimals Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

### How to Solve Equations with Decimals

You can solve an equation by using the equality properties to isolate the variable.

To solve equations with decimals you isolate the variable like you would an equation without decimals.

Example 1:  $y - 4.35 = 8.3$

Example 2:  $\frac{x}{3.4} = -9.8$

Example 3:  $2.4x - 7.6 = 6.8$

### Practice

Solve and Check.

1).  $8.97 + x = -97.6$

2).  $\frac{y}{2.5} - 9.7 = 64.3$

3).  $-8.24x = -24.72$

4).  $8.25y + 98 = 494$



# Decimal Equations Tic Tac Toe

Work in pairs. One person is X and the other is Y. Player X starts first. Choose a problem on the board. Show work on another sheet of paper. Then Player Y needs to check the answer with a calculator. If the problem is correct put a big X in the box. Next Player Y chooses any problem available on the board. Follow the same steps. Continue taking turns until someone wins or there are no problems left. You win by getting four in a row, column, or diagonal. If no one gets 4 then the player with the most marks on the board wins.

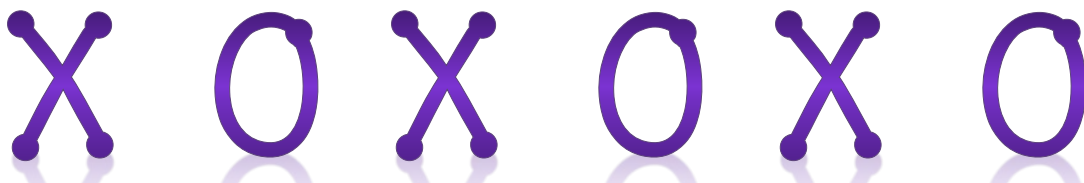
$2.67x = -24.03$	$\frac{x}{2.1} = 8.54$	$2x - 12.5 = 98.7$	$0.68 + y = 0.21$
$-87.5 + h = -54.231$	$\frac{x}{0.4} = -9.8$	$P - 2.5 = -3.8$	$4x + 12.6 = 36.6$
$-\frac{k}{3.3} = -9.8$	$8.7 + h = -9.6$	$Y - 0.234 = 0.234$	$\frac{x}{3.4} - 76.9 = 8.9$
$f + 87.65 = 47.32$	$B - 0.15 = -0.38$	$\frac{m}{8.6} = -5.41$	$2.51x = 7.53$



# Decimal Equations Tic Tac Toe

Work in pairs. One person is X and the other is Y. Player X starts first. Choose a problem on the board. Show work on another sheet of paper. Then Player Y needs to check the answer with a calculator. If the problem is correct put a big X in the box. Next Player Y chooses any problem available on the board. Follow the same steps. Continue taking turns until someone wins or there are no problems left. You win by getting four in a row, column, or diagonal. If no one gets 4 then the player with the most marks on the board wins.

$2.67x = -24.03$ $X = -9$	$\frac{x}{2.1} = 8.54$ $X = 17.934$	$2x - 12.5 = 98.7$ $X = 55.6$	$0.68 + y = 0.21$ $Y = -0.47$
$-87.5 + h = -54.231$ $H = 33.269$	$\frac{x}{0.4} = -9.8$ $X = -3.92$	$P - 2.5 = -3.8$ $P = -1.3$	$4x + 12.6 = 36.6$ $X = 6$
$-\frac{k}{3.3} = -9.8$ $K = 32.34$	$8.7 + h = -9.6$ $H = -18.3$	$Y - 0.234 = 0.234$ $Y = 0.468$	$\frac{x}{3.4} - 76.9 = 8.9$ $X = 291.72$
$f + 87.65 = 47.32$ $f = -40.33$	$B - 0.15 = -0.38$ $B = -0.23$	$\frac{m}{8.6} = -5.41$ $M = -46.526$	$2.51x = 7.53$ $X = 3$



## Equations with Decimals Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $7.8 + 2x = -25.12$

2).  $\frac{y}{3.4} - 3.6 = 7.14$

3).  $-12m = -59.76$

4).  $\frac{k}{54.7} = 1.8$

5).  $p - 5.89 = -1.2$

6).  $y - (-9.86) = 4.8$

7). Kellie bought 3 spiral notebooks and one pack of paper that cost \$0.75. If she spent \$2.10 in total, how much did each notebook cost? Write the equation and give the solution.

8).  $\frac{w}{4.3} - 9.8 = 70$

## Equations with Decimals Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $7.8 + 2x = -25.12$

$x = -16.46$

2).  $\frac{y}{3.4} - 3.6 = 7.14$   $y = 36.516$

3).  $-12m = -59.76$   $x = 4.98$

4).  $\frac{k}{54.7} = 1.8$   $k = 98.46$

5).  $p - 5.89 = -1.2$   $p = 4.69$

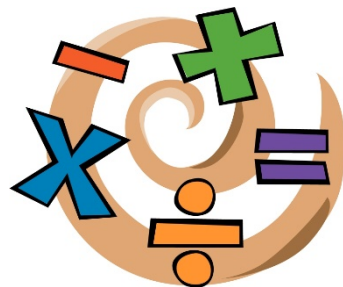
6).  $y - (-9.86) = 4.8$   $y = -5.06$

7). Kellie bought 3 spiral notebooks and one pack of paper that cost \$0.75. If she spent \$2.10 in total, how much did each notebook cost?

$3x + 0.75 = 2.10$   $y = 0.45$

8).  $\frac{w}{4.3} - 9.8 = 70$   $w = 343.14$

# Equations with Fractions



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# Warm Up

Solve and Check.

1).  $3.45 + y = -67.8$  **Y= -71.25**

2).  $\frac{y}{7.4} = 6.9$  **Y= 51.06**

3).  $-0.2x = -9.88$  **X = 49.4**

4).  $\frac{k}{3.14} + 9.2 = 11.8$  **K= 8.164**

## Solving Equations with Fractions

**Example 1:**  $\frac{2}{7} + y = \frac{5}{7}$

$$\begin{array}{r} \frac{2}{7} + y = \frac{5}{7} \\ -\frac{2}{7} \quad -\frac{2}{7} \\ \hline \end{array}$$

$$y = \frac{3}{7}$$

**Example 2:**  $x - \frac{2}{5} = \frac{1}{2} \rightarrow \frac{5}{10}$

$$\begin{array}{r} x - \frac{2}{5} = \frac{1}{2} \rightarrow \frac{5}{10} \\ +\frac{4}{10} \quad +\frac{4}{10} \\ \hline \end{array}$$

$$x = \frac{9}{10}$$

Isolate the “y” by subtracting  $\frac{2}{7}$  from each side.

Isolate the “x” by adding  $\frac{2}{5}$  to both sides. We found a common denominator and renamed our fractions so we could add them.

Example 3:  $\frac{3}{2} \cdot \frac{2}{3} x = \frac{1}{5} \cdot \frac{3}{2}$

$$x = \frac{3}{10}$$

Example 4:  $\frac{2}{5} x + 8 = -16$

---

$$\frac{5}{2} \cdot \frac{2}{5} x = -24 \cdot \frac{5}{2}$$

$$x = -\frac{120}{2} = -60$$

To isolate the variable you need to divide both sides by  $\frac{2}{3}$ . When you divide fractions you multiply by the reciprocal so we multiply both sides of the equation by  $\frac{3}{2}$ .

To isolate the variable you have to subtract 8 and multiply by  $\frac{5}{2}$ .



## Practice

Solve and Check.

$$1). \quad \frac{5}{6}k = \frac{1}{2} \quad K = \frac{3}{5}$$

$$2). \quad \frac{2}{3} + y = -\frac{3}{5} \quad y = -1\frac{4}{15}$$

$$3). \quad -2\frac{1}{3}p = \frac{2}{5} \quad P = -\frac{6}{35}$$

$$4). \quad \frac{3}{7}x + 8 = 10 \quad x = 4\frac{2}{3}$$

# Closure

How is solving equations with decimals and fractions different than equations with integers?  
How are they alike?

## Equations with Fractions Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

Example 1:  $\frac{2}{7} + y = \frac{5}{7}$

Example 2:  $x - \frac{2}{5} = \frac{1}{2}$

Example 3:  $\frac{2}{3}x = \frac{1}{5}$

Example 4:  $\frac{2}{5}x + 8 = -16$

### Practice

Solve and Check.

1).  $\frac{5}{6}k = \frac{1}{2}$

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

3).  $-2\frac{1}{3}p = \frac{2}{5}$

4).  $\frac{3}{7}x + 8 = 10$

## Pairs Work

1. Partners work on a worksheet. One student works on the problem while the other watches and helps, if necessary.
2. The partner checks the work for agreement. If the partners don't agree on the answer, they may ask the other pair on the team. If the team as a whole cannot agree on the answer, the team asks the teacher for help.
3. Partners switch roles.
4. Team meets to compare answers. If they disagree they are to raise their hands.



# Equations with Fractions Pairs Check

Name \_\_\_\_\_

Name \_\_\_\_\_

$$1). \frac{8}{9} + y = \frac{5}{9}$$

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

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

$$4). y + -\frac{3}{10} = \frac{1}{3}$$

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

$$6). -\frac{4}{5}a = -\frac{2}{5}$$

$$7). 3x - \frac{2}{5} = -\frac{7}{10}$$

$$8). 3\frac{2}{3} + n = 1\frac{2}{5}$$

# Equations with Fractions Pairs Check

Name \_\_\_\_\_

Name \_\_\_\_\_

$$1). \frac{8}{9} + y = \frac{5}{9} \quad x = -\frac{1}{3}$$

$$2). -2n - \frac{1}{2} = \frac{3}{4} \quad n = -\frac{5}{8}$$

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

$$x = \frac{5}{18}$$

$$4). y + -\frac{3}{10} = \frac{1}{3}$$

$$y = \frac{19}{30}$$

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

$$x = \frac{1}{2}$$

$$6). -\frac{4}{5}a = -\frac{2}{5}$$

$$a = \frac{1}{2}$$

$$7). 3x - \frac{2}{5} = -\frac{7}{10}$$

$$x = -\frac{1}{10}$$

$$8). 3\frac{2}{3} + n = 1\frac{2}{5}$$

$$n = -2\frac{4}{15}$$

## Fraction Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $7\frac{1}{2} + x = -\frac{2}{5}$

2).  $\frac{2}{3}y = -\frac{1}{9}$

3).  $-\frac{3}{5}m + (-2) = 66$

4).  $\frac{3}{4}k = 1\frac{1}{3}$

5).  $7p - \frac{5}{7} = -\frac{3}{7}$

6).  $\frac{5}{8} + m = \frac{3}{4}$

7).  $2y = \frac{9}{11}$

8).  $\frac{4}{5} - h = -\frac{1}{3}$

## Fraction Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

$$1). 7\frac{1}{2} + x = -\frac{2}{5} \quad x = -7\frac{9}{10}$$

$$2). \frac{2}{3}y = -\frac{1}{9} \quad y = -\frac{1}{6}$$

$$3). -\frac{3}{5}m + (-2) = 6 \quad m = -13\frac{1}{3}$$

$$4). \frac{3}{4}k = 1\frac{1}{3} \quad k = 1\frac{7}{9}$$

$$5). 7p - \frac{5}{7} = -\frac{3}{7} \quad p = \frac{2}{49}$$

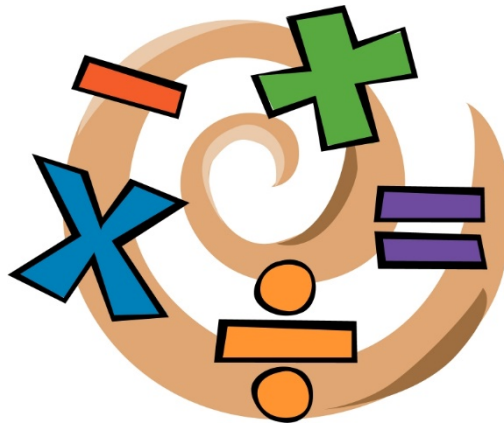
$$6). \frac{5}{8} + m = \frac{3}{4} \quad m = \frac{1}{8}$$

$$7). 2y = \frac{9}{11} \quad y = \frac{9}{22}$$

$$8). \frac{4}{5} - h = -\frac{1}{3} \quad h = 1\frac{2}{15}$$



# Multi-Step Equations



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# Warm Up

Solve and Check.

$$1). \frac{1}{3}x - 9 = 11 \quad X = 60$$

$$2). -4x + \frac{2}{3} = \frac{5}{6} \quad x = -\frac{1}{24}$$

$$3). \frac{3}{4}x + 7 = -4 \quad X = -14\frac{2}{3}$$

$$4). \frac{y}{7} - 6 = -5 \quad Y = 7$$

## Combining Like Terms to Solve Equations

**Example 1:**  $9m + 6 - 7m = 14$

Combine like terms first.

$$2m + 6 = 14$$

Subtract 6 from both sides.

$$\underline{-6} \quad \underline{-6}$$

$$\underline{2m} = \underline{8}$$

Divide both sides by 2.

$$2 \quad 2$$

$$m = 4$$

## Using the Distributive Property to Solve Equations

If your equation has parentheses you will need to distribute. After you distribute you combine like terms if needed and then isolate the variable.

Example 2:  $4(y - 2) + 7 = 23$

On the left side of  $4y - 8 + 7 = 23$

the equation,  
distribute the 4  
and then  
combine the -8  
and 7.

$$\begin{array}{r} 4y - 1 = 23 \\ + 1 \quad +1 \\ \hline \end{array}$$

Add 1 to  
both sides.

$$\begin{array}{r} 4y = 24 \\ \hline 4 \quad 4 \end{array}$$

Divide both  
sides by 4.

$$x = 6$$

**Example 3:**  $2(y + 6) - 8y + 3 = 51$

$$2y + 12 - 8y + 3 = 51$$

$$-6y + 15 = 51$$

$$\underline{-15 \quad -15}$$

$$\underline{-6y = 36}$$

$$\underline{-6 \quad -6}$$

$$x = -6$$

## Practice

Solve and Check.

1).  $-7y - 9 + 17y = 1$   $Y = 1$

2).  $8(j - 3) - 6j = 100$   $J = 62$

3).  $h + 18 + 3h = 74$   $H = 14$

4).  $4(g - 2) + 7 - 3g = 45$   $G = 46$

# Closure

List the steps that you would take to solve the following equation.

$$7h + 3(h - 6) + 24 = 130$$

## Multi-Step Equations Guided Notes

Name \_\_\_\_\_ Date \_\_\_\_\_

### Combining Like Terms to Solve Equations

Example 1:  $9m + 6 - 7m = 14$

### Using the Distributive Property to Solve Equations

Example 2:  $4(y - 2) + 7 = 23$

Example 3:  $2(y + 6) - 8y + 3 = 51$

Practice Solve and Check.

1).  $-7y - 9 + 17y = 1$

2).  $8(j - 3) - 6j = 100$

3).  $h + 18 + 3h = 74$

4).  $4(g - 2) + 7 - 3g = 45$



Name \_\_\_\_\_ Date \_\_\_\_\_

### Multi-Step Equations

Solve each problem and circle your answer. Show your work in the space below the problem.  
Find the problem on the coloring sheet and color each section with the color your circled.

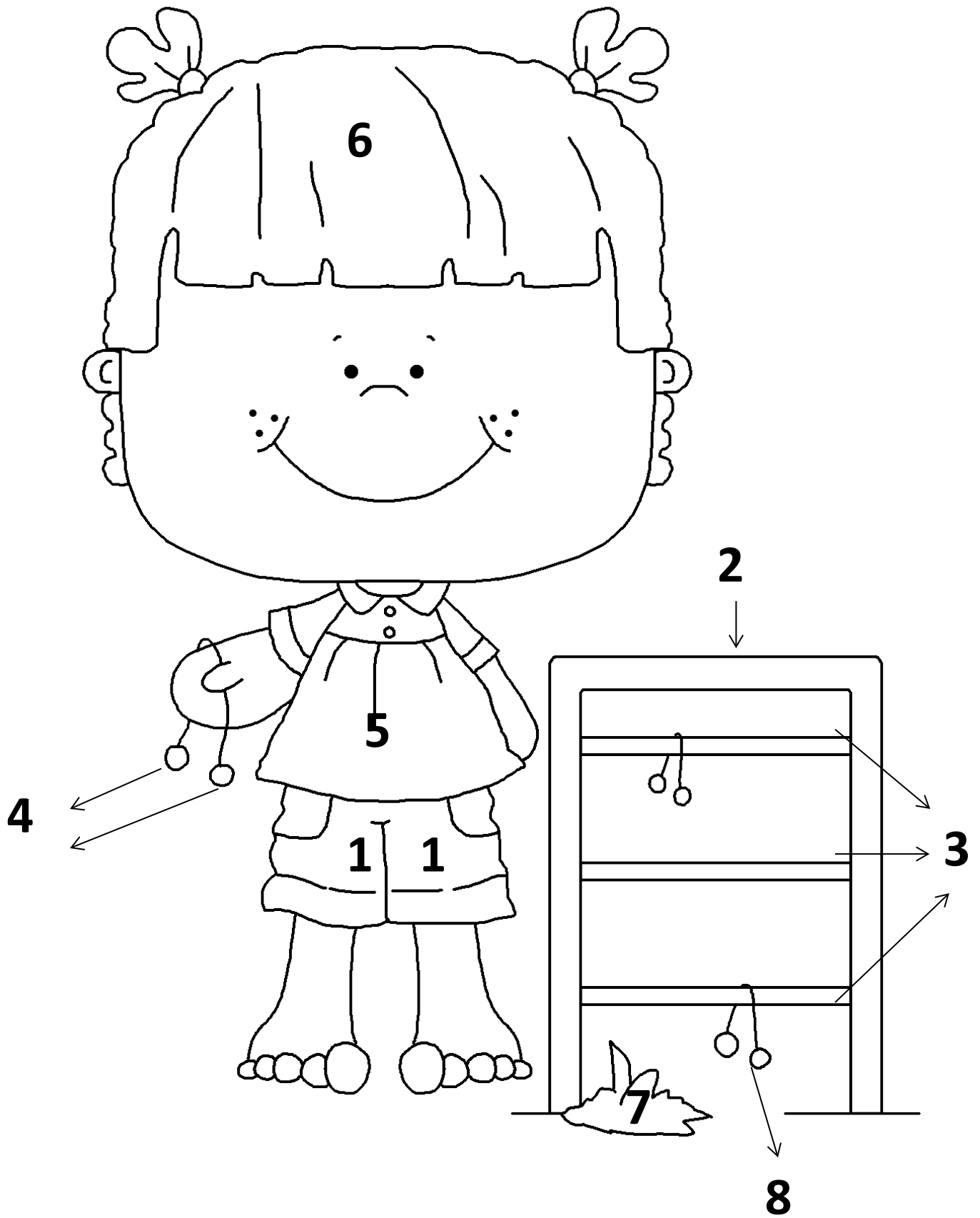
#	Problem	Answer 1	Answer 2	Answer 3
1	$2x + 4 - 9x = 18$	2 Yellow	-3 Orange	-2 Blue
2	$3(2x + 6) = 36$	2 Yellow	3 Brown	6 Orange
3	$23y + 90 - 3y = -90$	-9 Black	9 Orange	18 Yellow
4	$3(n + 5) + 2 = 26$	3 Red	4 Pink	-3 Purple
5	$-4x + 9 - 12x - 5 = 68$	-4 Orange	4 Green	-16 Red
6	$4 - 2(g - 6) = -8$	17 White	12 Yellow	6 Blue
7	$y - 6 + 7y = 42$	8 Blue	5 Black	6 Green
8	$-8 + 2x + 7 - 5x = 23$	-6 Red	-7 Gray	-8 Purple

Name \_\_\_\_\_ Date \_\_\_\_\_

### Multi-Step Equations

Solve each problem and circle your answer. Show your work in the space below the problem.  
Find the problem on the coloring sheet and color each section with the color your circled.

#	Problem	Answer 1	Answer 2	Answer 3
1	$2x + 4 - 9x = 18$	2 Yellow	-3 Orange	-2 Blue
2	$3(2x + 6) = 36$	2 Yellow	3 Brown	6 Orange
3	$23y + 90 - 3y = -90$	-9 Black	9 Orange	18 Yellow
4	$3(n + 5) + 2 = 26$	3 Red	4 Pink	-3 Purple
5	$-4x + 9 - 12x - 5 = 68$	-4 Orange	4 Green	-16 Red
6	$4 - 2(g - 6) = -8$	17 White	12 Yellow	6 Blue
7	$y - 6 + 7y = 42$	8 Blue	5 Black	6 Green
8	$-8 + 2x + 7 - 5x = 23$	-6 Red	-7 Gray	-8 Purple



## Multi-Step Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $-6x + 8 - 4x = -24$

2).  $-5(y + 4) - 3y = 20$

3).  $8m + 6 - 14m = -64$

4).  $3(j - 5) - 3 = 45$

5).  $2(b + 6) = -24$

6).  $5f - 3 + 6f = 47$

7).  $9y + 14 - 10y - 34 = 100$

8).  $10(7 + 2x) - 3x = 98$

## Multi-Step Equations Practice

Name \_\_\_\_\_ Date \_\_\_\_\_

Solve and Check.

1).  $-6x + 8 - 4x = -24$   **$x = 3.2$**

2).  $-5(y + 4) - 3y = 20$   **$y = -5$**

3).  $8m + 6 - 18m = -64$

**$m = 7$**

4).  $3(j - 5) - 3 = 45$   **$j = 21$**

5).  $2(b + 6) = -24$   **$b = -18$**

6).  $5f - 3 + 6f = 41$   **$f = 4$**

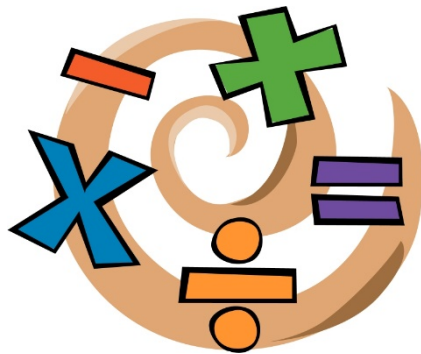
7).  $9y + 14 - 10y - 34 = 100$

**$Y = -120$**

8).  $10(7 + 2x) - 30x = 98$

**$X = -2.8$**

# Expression and Equation Test Review



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# Warm Up

**Solve and Check.**

1).  $\frac{x}{3.4} + 8.67 = -20.3$       **X= -98.498**

2).  $4y - 3 + 8y = 21$       **X=2**

3).  $2(x + 8) - 9 = -117$       **X= -62**

4).  $8y - 9 = 73$       **Y=10.25**

## Things to know for your Expression/Equation Test

- Be able to identify like and unlike terms
- Use the distributive property to solve problems and simplify expressions.
- Simplify expressions.
- Solve one-step equations with rational numbers (integers, fractions, decimals).
- Solve two-step equations with rational numbers.
- Solve multi-step equations.
- Be able to write equations and expressions from word problems.



## Things to know for your Expression/Equation Test

- Be able to identify like and unlike terms
- Use the distributive property to solve problems and simplify expressions.
- Simplify expressions.
- Solve one-step equations with rational numbers (integers, fractions, decimals).
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- Solve multi-step equations.
- Be able to write equations and expressions from word problems.

## Things to know for your Expression/Equation Test

- Be able to identify like and unlike terms
- Use the distributive property to solve problems and simplify expressions.
- Simplify expressions.
- Solve one-step equations with rational numbers (integers, fractions, decimals).
- Solve two-step equations with rational numbers.
- Solve multi-step equations.
- Be able to write equations and expressions from word problems.

## Square Game Instructions

Students can play in pairs or in groups. The first player chooses a card and does the problem. The second player has the answer key and checks the answer. If they get it correct they mark the square that has the same letter as the problem. The next player draws a card and does the problem and marks the square if they get it correct. Students continue to do this until time is up or they run out of problems. The more squares they cover the more points they get.

You can also just print out the cards and not cut them out and let the students choose which question they want to answer by looking at the board. They get more points by getting three in a row or making a square so they can block each other by choosing the appropriate question.

You can laminate the game board or put it in a sheet protector and have students mark the square with their initials using a dry erase marker. You could also just use different beans or small pieces of paper to mark the squares.

# The Square Game

A	B	C	D	E
F	G	H	I	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y

**1 point for every block covered**

**3 in a row = 2 Bonus Points**

**A square of 4 = 5 Bonus Points**

A

Write the equation.

Hal's age divided by 4  
is 8.

B

Write the equation.

The product of a  
number and 6 is 5.

C

Write the expression.

The quotient of a  
number and 7 increased  
by 8.

D

Write the equation.

Fifteen decreased by a  
number is 6.

E

$$7x + -2 - 5x$$

What are the like terms?

F

$$7y + 8xy - 15y + 2y^2$$

What are the like terms?

G

Distribute.

$$8(4 - 3)$$

H

Distribute.

$$4(5x + 6)$$

I

Distribute.

$$-6(x - 9)$$

J

Simplify.

$$3x^2 - 7 + 2x^2$$

K

Simplify.

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

L

Simplify.

$$17y + -35xy + 8xy$$

M

$$63 + x = 902$$

N

$$1.7x = 0.85$$

O

$$\frac{w}{1.21} = 2.32$$

p

$$-4m - 7 = 17$$

Q

$$2 = -6x + 4$$

R

$$12 + \frac{x}{6.5} = 16$$

S

$$3n + 8.2 = 20.2$$

T

$$\frac{y}{5} - 15 = 2$$



U

$$-6x + 23 - 9x = -7$$

V

$$-7(y - 5) + 8 = -27$$

W

$$-8y - 2 + 17y = -56$$

X

$$-5 + \frac{y}{-9} + 7 = 13$$

y

Write the equation and solve it.

Ian bought a cupcake for \$2.34 and 2 colas. If his total bill was \$4.48, how much did each cola cost?

## Expression and Equation Square Game Answer Key

A-  $\frac{A}{4} = 8$  or  $A \div 4$

Y-  $2.34+2c=4.48$   $c=1.07$

B-  $6x = 5$

C-  $\frac{x}{7} + 8$

D-  $15 - x = 6$

E-  $7x, -5x$

F-  $7y, -15y$

G-  $8(4) - 8(3) = 8$

H-  $20x + 24$

I-  $-6x + 54$

J-  $5x^2 - 7$

K-  $3x + 24$

L-  $17y - 27xy$

M-  $X = 839$

N-  $X=0.5$

O-  $W=2.8072$

P-  $M= -6$

Q-  $X = 1/3$

R-  $X=26$

S-  $N=4$

T-  $Y=85$

U-  $X=2$

V-  $Y=10$

W-  $Y= -6$

X-  $Y= -99$

# Expression and Equation Test

Name \_\_\_\_\_ Date \_\_\_\_\_

Write the expression or equation for each problem.

- 1). Two increased by a number is seven. \_\_\_\_\_
- 2). The product of 5 and 6 plus a number is eight. \_\_\_\_\_
- 3). The quotient of 18 and a number. \_\_\_\_\_
- 4). Five less than Greg's age. \_\_\_\_\_

List the like terms from each expression.

- 5).  $2x^2 + 3x - 7 + 6x^2$  \_\_\_\_\_
- 6).  $7y - 8x + 9y - 2$  \_\_\_\_\_

Distribute to solve or simplify.

- 7).  $-2(x + 8)$  \_\_\_\_\_
- 8).  $3(2y - 5)$  \_\_\_\_\_
- 9).  $5(7 + 2)$  \_\_\_\_\_

Simplify each expression.

- 10).  $6y + 3y + 6y - 2y$  \_\_\_\_\_
- 11).  $18 + 7x - 12 + 5x$  \_\_\_\_\_
- 12).  $2(x - 5) + 7x + 4$  \_\_\_\_\_
- 13).  $-8 - 7(y + 2)$  \_\_\_\_\_
- 14).  $x - 9x + 3 + 8x - 3$  \_\_\_\_\_

Solve and Check.

15).  $n + 17 = 98$

16).  $\frac{c}{5} = -35$

17).  $356 = y - 219$

18).  $X + \frac{3}{5} = \frac{9}{10}$

19).  $-2m + 14 = 10$

20).  $\frac{y}{8} - 15 = 2$

21).  $9.8 + y = -87.6$

22).  $\frac{x}{7.8} = -54.3$

23).  $7h + 9 - 8h = -32$

24).  $10r - 9 = 54$

25).  $2(x + 3) + 8 = -18$

26).  $\frac{2}{3}X - 12 = -10$

# Expression and Equation Test

Name \_\_\_\_\_ Date \_\_\_\_\_

Write the expression or equation for each problem.

- 1). Two increased by a number is seven.  $2+x=7$
- 2). The product of 5 and 6 plus a number is eight.  $5(6+x)=8$
- 3). The quotient of 18 and a number.  $\frac{18}{x}$  or  $18 \div x$
- 4). Five less than Greg's age.  $G-5$

List the like terms from each expression.

- 5).  $2x^2 + 3x - 7 + 6x^2$   $2x^2, 6x^2$
- 6).  $7y - 8x + 9y - 2$   $7y, 9y$

Distribute to solve or simplify.

- 7).  $-2(x + 8)$   $-2x-16$
- 8).  $3(2y-5)$   $6y-15$
- 9).  $5(7+2)$   $5(7) + 5(2)= 45$

Simplify each expression.

- 10).  $6y + 3y + 6y - 2y$   $13y$
- 11).  $18 + 7x - 12 + 5x$   $12x+6$
- 12).  $2(x - 5) + 7x + 4$   $9x-6$
- 13).  $-8 - 7(y + 2)$   $-7y+-22$
- 14).  $x - 9x + 3 + 8x - 3$   $0$

Solve and Check.

$$15). n + 17 = 98$$

$$N=81$$

$$16). \frac{c}{5} = -35$$

$$c = -175$$

$$17). 356 = y - 219$$

$$Y=575$$

$$18). X + \frac{3}{5} = \frac{9}{10}$$

$$x = 3/10$$

$$19). -2m + 14 = 10$$

$$M=2$$

$$20). \frac{y}{8} - 15 = 2$$

$$y=136$$

$$21). 9.8 + y = -87.6$$

$$Y = -97.4$$

$$22). \frac{x}{7.8} = -54.3$$

$$x = -423.54$$

$$23). 7h + 9 - 8h = -32$$

$$H=41$$

$$24). 10r - 9 = 54$$

$$r=6.3$$

$$25). 2(x + 3) + 8 = -18$$

$$X=-16$$

$$26). \frac{2}{3}X - 12 = -10$$

$$x=3$$