



Objectives: SWBAT complete 7th grade math questions to prepare for 8th Math.

Rising 8th Math Summer Packet

First & Last: _____

Date: _____

HR: _____

- ✓ Annotate the texts
- ✓ Solve the problems
- ✓ Show your work
- ✓ Label the units
- ✓ Circle your answers

Rising 8th Math Summer Packet

Eighth grade math classes are designed to move students into the study of algebra. The integration of new and prior knowledge to solve algebraic problems is the major focus, but mathematical thinking and the continuing development of logical reasoning skills are also emphasized. In order for students to be successful, it is critical that students have a firm foundation in skills taught in previous math courses.

This packet is designed to give students additional practice with those skills. The problems in this packet review content areas that are necessary for success in eighth grade math classes. **It is important students show their work, including all the steps that led to the solution. This packet is due the first day of school.**

Order of Operations

To avoid having different results for the same problem, mathematicians have agreed on an order of operations when simplifying expressions that contain multiple operations.

1. Perform any operation(s) inside grouping symbols. (Parentheses, brackets, above or below a fraction bar)
2. Simplify any term with exponents.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

One easy way to remember the order of operations process is to remember the acronym PEMDAS or the old saying "Please Excuse My Dear Aunt Sally."

P --Perform operations in grouping symbols
E -- Simplify exponents
M -- Perform multiplication and division in order from left to right
D
A -- Perform addition and subtraction in order from left to right
S

Example 1

$$\begin{aligned}2 - 3^2 + (6 + 3 \times 2) \\2 - 3^2 + (6+6) \\2 - 3^2 + 12 \\2 - 9 + 12 \\-7 + 12 \\=5\end{aligned}$$

Example 2

$$\begin{aligned}-7 + 4 + (2^3 - 8 \div -4) \\-7 + 4 + (8 - 8 \div -4) \\-7 + 4 + (8 - -2) \\-7 + 4 + 10 \\-3 + 10 \\=7\end{aligned}$$

Order of Operations

Evaluate each expression. Remember your order of operations (PEMDAS).

1. $6 + 4 - 2 \cdot 3 =$

2. $(-2) \cdot 3 + 5 - 7 =$

3. $15 \div 3 \cdot 5 - 4 =$

4. $29 - 3 \cdot 9 + 4 =$

5. $20 - 7 \cdot 4 =$

6. $4 \cdot 9 - 9 + 7 =$

7. $50 - (17 + 8) =$

8. $(12 - 4) \div 8 =$

Operations with Signed Numbers

Adding and Subtracting Signed Numbers

Adding Signed Numbers

Like Signs	Different Signs
Add the numbers & carry the sign	Subtract the numbers & carry the sign of the larger number
$(+) + (+) = +$ $(+3) + (+4) = +7$	$(+) + (-) = ?$ $(+3) + (-2) = +1$
$(-) + (-) = -$ $(-2) + (-3) = -5$	$(-) + (+) = ?$ $(-5) + (+3) = -2$

Subtracting Signed Numbers

Don't Subtract! Change the problem to **addition** and change the sign of the **second** number.
Then use the addition rules.

$(+9) - (+12) = (+9) + (-12)$	$(+4) - (-3) = (+4) + (+3)$
$(-5) - (+3) = (-5) + (-3)$	$(-1) - (-5) = (-1) + (+5)$

Simplify. *Do not use a calculator for this section.*

1. $9 + -4 =$

7. $20 - -6 =$

2. $-8 + 7 =$

8. $7 - 10 =$

3. $-14 - 6 =$

9. $-6 - -7 =$

4. $-30 + -9 =$

10. $5 - 9 =$

5. $14 - 20 =$

11. $-8 - 7 =$

6. $-2 + 11 =$

12. $1 - -12 =$

Multiplying and Dividing Signed Numbers

If the signs are the same, the answer is <i>positive</i> .	If the signs are different, the answer is <i>negative</i> .
Like Signs	Different Signs
$(+)(+) = +$ $(+3)(+4) = +12$	$(+)(-) = -$ $(+2)(-3) = -6$
$(-)(-) = +$ $(-5)(-3) = +15$	$(-)(+) = -$ $(-7)(+1) = -7$
$\frac{+}{+} = +$ $\frac{+12}{+4} = +3$	$\frac{+}{-} = -$ $\frac{+6}{-3} = -2$
$\frac{-}{-} = +$ $\frac{-15}{-3} = +5$	$\frac{-}{+} = -$ $\frac{-7}{+1} = -7$

Simplify. *Do not use a calculator for this section.*

1. $(-5)(-3) =$

7. $\frac{-7}{-1} =$

2. $\frac{-6}{2} =$

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

3. $(2)(4) =$

9. $\frac{8}{-4} =$

4. $\frac{-12}{-4} =$

10. $(-2)(7) =$

5. $(-1)(-5) =$

11. $\frac{-20}{-1} =$

Evaluating Expressions

Example

Evaluate the following expression when $x = 5$

Rewrite the expression substituting 5 for the x and simplify.

- a. $5x = 5(5) = 25$
- b. $-2x = -2(5) = -10$
- c. $x + 25 = 5 + 25 = 30$
- d. $5x - 15 = 5(5) - 15 = 25 - 15 = 10$
- e. $3x + 4 = 3(5) + 4 = 15 + 4 = 19$

Evaluate each expression given that: $x = 5$ $y = -4$ $z = 6$

1. $3x$

9. $5x - (y + 2z)$

2. $2x^2$

10. $\frac{xy}{2}$

3. $3x^2 + y$

11. $x^2 + y^2 + z^2$

4. $2(x + z) - y$

12. $2x(y + z)$

5. $y + 4$

13. $5z + (y - x)$

Combining Like Terms

What is a **term**?

The parts of an algebraic expression that are separated by an addition or subtraction sign are called **terms**.

The expression $4x + 2y - 3$ has 3 terms.

What are **like terms**?

Terms with the same variable factors are called **like terms**.

$2n$ and $3n$ are **like terms**, but $4x$ and $3y$ are not like terms because their variable factors x and y are different.

To simplify an expression, you must combine like terms.

Examples:

Simplify

1. $5x + 8x$
 $5x + 8x = (5 + 8)x = 13x$

2. $3x + 4 - 2x + 3$
 $3x - 2x + 4 + 3 = (3 - 2)x + 4 + 3 = x + 7$

3. $3y - 6y$
 $3y - 6y = (3 - 6)y = -3y$

4. $2b + 5c + 3b - 6c$
 $2b + 3b + 5c - 6c = (2 + 3)b + (5 - 6)c = 5b - c$

Practice: Simplify each expression

1. $6n + 5n$

2. $25b + 15b$

3. $37z + 4z$

4. $x - 5x$

5. $3n + 1 - 2n + 8$

6. $4f + 5f - 6 + 8$

7. $7t + 9 - 4t + 3$

8. $2k + 4 - 8k - 1$

Solving Equations

To solve an equation means to **find the value** of the variable. We solve equations by isolating the variable using opposite operations.

Example:

Solve.

$$\begin{array}{r} 3x - 2 = 10 \\ +2 \quad +2 \end{array}$$

Isolate $3x$ by adding 2 to each side.

$$\frac{3x}{3} = \frac{12}{3}$$

Simplify

Isolate x by dividing each side by 3.

$$x = 4$$

Simplify

Check your answer.

$$3(4) - 2 = 10$$

Substitute the value in for the variable.

$$12 - 2 = 10$$

Simplify

$$10 = 10$$

Is the equation true? If yes, you solved it correctly!

Opposite Operations:

Addition (+) & Subtraction (-)
Multiplication (x) and Division (\div)

Please remember...

to do the same step on
each side of the equation.

**Always check your
work by substitution!**

Try these:

Solve each equation below.

1. $x + 3 = 5$

2. $w - 4 = 10$

3. $c - 5 = -8$

4. $3p = 9$

5. $-7k = 14$

6. $-x = -17$

7. $\frac{h}{3} = 5$

8. $\frac{m}{8} = 7$

Plot each point on the graph below. Remember, coordinate pairs are labeled (x,y). Label each point on the graph with the letter given.

1. A(3,4)

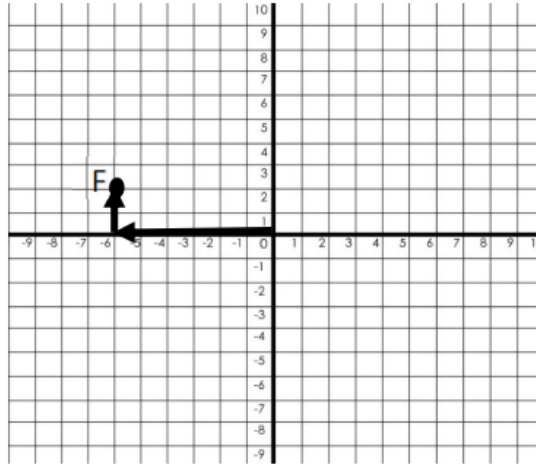
2. B(4,0)

3. C(-4,2)

4. D(-3,-1)

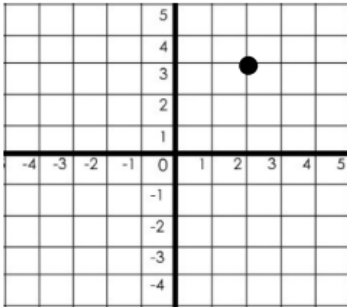
5. E(0,7)

Example: F(-6,2)

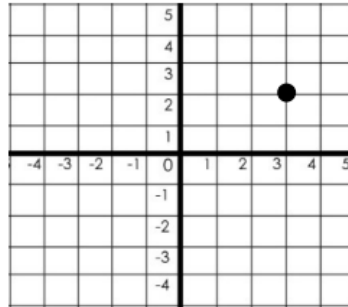


Determine the coordinate for each point below:

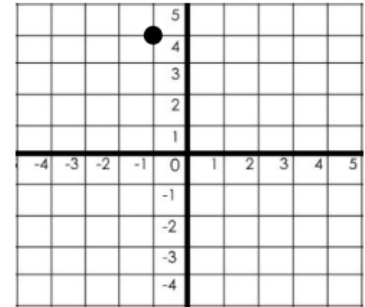
Example (2, 3)



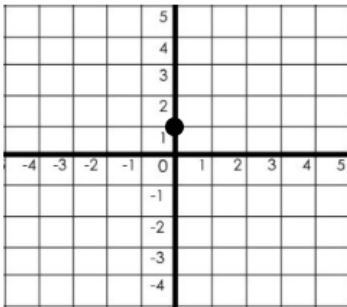
6. (__, __)



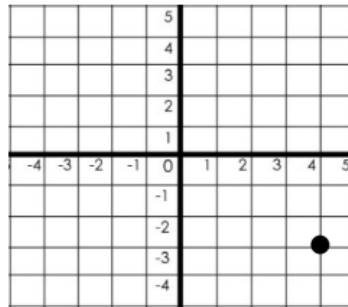
7. (__, __)



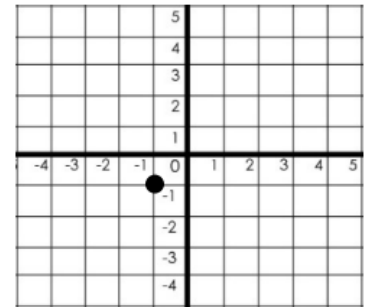
8. (__, __)



9. (__, __)



10. (__, __)



Word Problem Practice Set

1. A video store charges a one-time membership fee of \$12.00 plus \$1.50 per video rental. How many videos can Stewart rent if he spends \$21?
2. Bicycle city makes custom bicycles. They charge \$160 plus \$80 for each day that it takes to build the bicycle. If you have \$480 to spend on your new bicycle, how many days can it take Bicycle City to build the bike?
3. Darel went to the mall and spent \$41. He bought several t-shirts that each cost \$12 and he bought 1 pair of socks for \$5. How many t-shirts did Darel buy?
4. Janet weighs 20 pounds more than Anna. If the sum of their weights is 250 pounds, how much does each girl weigh?
5. Three-fourths of the student body attended the pep rally. If there were 1230 students at the pep rally, how many students are there in all?
6. Two-thirds of the Algebra students took the H S A the first time. If 60 students took the algebra H S A, how many algebra students are there in all?