



Parents and Students,

We know the 2020-2021 school year is one that we will never forget. So as we move forward we want to be prepared for another fantastic year of learning in the fall. We are asking that each student complete the attached summer math packet in preparation for the upcoming school year. The packet will be due on the First Day of Class and will be the first grade of the nine weeks. Below you will find instructions on how to complete the packet as well as a link to video resources that will be helpful for each topic covered.

- **Show All Work** for every problem
 - Show work in the space provided in the packet or on your own paper that will be stapled to the packet.
 - Packets turned in without work will not be graded.
- Calculators are allowed to be used as long as all work is shown.
- Link to helpful resources:
 - <https://bit.ly/3nsmTwu>

Thank you and have a wonderful summer!

Decatur City Schools
8th Grade Math Summer Packet

See the link for helpful videos on each topic: <https://bit.ly/3nsmTwu>

Evaluating Expressions

Below are some examples to help you solve the problems in this section.

Example 1: Evaluate $6x - 7$ if $x = 8$.

$$\begin{aligned} 6x - 7 &= 6(8) - 7 && \text{Replace } x \text{ with } 8. \\ &= 48 - 7 && \text{Use order of operations.} \\ &= 41 && \text{Subtract 7 from 48.} \end{aligned}$$

Example 2: Evaluate $5m - 15$ if $m = 6$.

$$\begin{aligned} 5m - 15 &= 5(6) - 15 && \text{Replace } m \text{ with } 6. \\ &= 30 - 15 && \text{Use order of operations.} \\ &= 15 && \text{Subtract 15 from 30.} \end{aligned}$$

Example 3: Evaluate $\frac{7b}{3}$ if $b = 6$.

$$\begin{aligned} \frac{7b}{3} &= \frac{(7)(6)}{3} && \text{Replace } b \text{ with } 6. \\ &= \frac{42}{3} && \text{Multiply 6 by 7.} \\ &= 14 && \text{Divide.} \end{aligned}$$

Example 4: Evaluate $x^3 + 4$ if $x = 3$.

$$\begin{aligned} x^3 + 4 &= 3^3 + 4 && \text{Replace } x \text{ with } 3. \\ &= 27 + 4 && \text{Use order of operations.} \\ &= 31 && \text{Add 27 and 4.} \end{aligned}$$

Problem Set

Directions: Evaluate the following expressions using the values for a, b, & c. Show your work!

1.) Evaluate $6 + 3b$ if $b = 7$

2.) Evaluate $6a^2$ if $a = 4$

3.) Evaluate $5(6) - c$ if $c = 7$

4.) Evaluate $\frac{b^4}{4}$ if $b = 2$

Order of Operations

Below are some examples to help you solve the problems in this section.

Use the order of operations to evaluate numerical expressions.

1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

Example 1: Evaluate $14 + 3(7 - 2) - 2 \cdot 5$

$$\begin{aligned} &14 + 3(7 - 2) - 2 \cdot 5 \\ &= 14 + 3(5) - 2 \cdot 5 && \text{Subtract first since } 7 - 2 \text{ is in parentheses} \\ &= 14 + 15 - 2 \cdot 5 && \text{Multiply left to right, } 3 \cdot 5 = 15 \\ &= 14 + 15 - 10 && \text{Multiply left to right, } 2 \cdot 5 = 10 \\ &= 29 - 10 && \text{Add left to right, } 14 + 15 = 29 \\ &= 19 && \text{Subtract 10 from 29} \end{aligned}$$

Example 2: $8 + (1 + 5)^2 \div 4$

$$\begin{aligned} &8 + (1 + 5)^2 \div 4 \\ &= 8 + (6)^2 \div 4 && \text{Add first since } 1 + 5 \text{ is in parentheses} \\ &= 8 + 36 \div 4 && \text{Find the value of } 6^2 \\ &= 8 + 9 && \text{Divide 36 by 4} \\ &= 17 && \text{Add 8 and 9} \end{aligned}$$

Problem Set

Directions: Evaluate each of the following expressions. Show your work!

5.) $(2 + 10)^2 \div 4$

6.) $(6 + 5) \cdot (8 - 6)$

7.) $72 \div 3 - 5(2.8) + 9$

8.) $3 \cdot 14(10 - 8) - 60$

Combining Like Terms

Below are some examples to help you solve the problems in this section.

- Like terms are terms that share the same variable.
- Terms can be added or subtracted from each other if they share the same variable.
- If they do not share the same variable, they cannot be added or subtracted. Variables without a coefficient (the number beside a variable) should be treated as having a 1 beside them.
- Numbers without a variable are called constants, and they cannot be combined with terms that have variables.

1. $5x + x - 3x$
 $6x - 3x$
 $3x$

2. $2a + 3a + 4b - b$
 $5a + 3b$

3. $-6y - 7y - 19z$
 $-13y - 19z$

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

Problem Set

Directions: Simplify each expression by combining like terms. Show your work!

9. $6m + m - 2m$

10. $3x + 5x + 7y - y$

11. $-4p - 6p - 10n$

12. $-6m + 8m + 6n - 10$

Solving Equations

Below are some examples to help you solve the problems in this section.

Remember, equations must always remain balanced.

- If you add or subtract the same number from each side of an equation, the two sides remain equal.
- If you multiply or divide the same number from each side of an equation, the two sides remain equal.

Example 1: Solve $x + 5 = 11$

$$\begin{array}{l} x + 5 = 11 \quad \text{Write the equation} \\ -5 = -5 \quad \text{Subtract 5 from both sides} \\ \hline x = 6 \quad \text{Simplify} \end{array}$$



$$\begin{array}{l} x + 5 = 11 \quad \text{Write the equation} \\ 6 + 5 = 11 \quad \text{Replace x with 6} \\ 11 = 11 \checkmark \quad \text{The sentence is true} \end{array}$$

Example 2: Solve $-21 = -3y$

$$\begin{array}{l} -21 = -3y \quad \text{Write the equation} \\ -3 = -3 \quad \text{Divide each side by } -3 \\ \hline 7 = y \quad \text{Simplify} \end{array}$$



$$\begin{array}{l} -21 = -3y \quad \text{Write the equation} \\ -21 = -3(7) \quad \text{Replace the y with 7} \\ -21 = -21? \quad \text{Multiply } - \text{ is the sentence true?} \end{array}$$

Example 3: Solve $3x + 2 = 23$

$$\begin{array}{l} 3x + 2 = 23 \quad \text{Write the equation} \\ -2 = -2 \quad \text{Subtract 2 from each side} \\ \hline \frac{3x}{3} = \frac{21}{3} \quad \text{Simplify} \\ \hline x = 7 \quad \text{Divide each side by 3} \\ \hline \quad \text{Simplify} \end{array}$$



$$\begin{array}{l} 3x + 2 = 23 \quad \text{Write the equation} \\ 3(7) + 2 = 23? \quad \text{Replace x with 7} \\ 21 + 2 = 23? \quad \text{Multiply} \\ 23 = 23? \quad \text{Add } - \text{ is the sentence true?} \end{array}$$

Example 4: Solve $\frac{x}{3} + 2 = 12$

$$\begin{array}{l} \frac{x}{3} + 2 = 12 \quad \text{Write the equation} \\ -2 = -2 \quad \text{Subtract 2 from each side} \\ \hline \frac{x}{3} = 10 \quad \text{Simplify to isolate x} \end{array}$$



$$\begin{array}{l} \frac{x}{3} + 2 = 12 \quad \text{Check your answer} \\ \frac{30}{3} + 2 = 12 \quad \text{Replace x w/30 \&} \end{array}$$

divide

$$\begin{array}{l} \frac{x}{3} = 10 \quad \text{Simplify to isolate x} \\ 3 \cdot \frac{x}{3} = 10 \cdot 3 \quad \text{Multiply both sides by 3} \\ x = 30 \quad \text{Simplified answer} \end{array}$$

$$\begin{array}{l} 10 + 2 = 12 \quad \text{Add} \\ 12 = 12 \quad \text{Is the sentence true?} \end{array}$$

Problem Set

Directions: Solve each equation. Show your work! Use your own paper if you need more room.

13. Solve $x - 9 = -12$

14. Solve $48 = -6r$

15. Solve $2t + 7 = -1$

16. Solve $4t + 4 = 12$

17. Solve $\frac{x}{4} = 21$

18. Solve $\frac{x}{4} + 3 = 10$

Graphing Points in the Coordinate Plane

Below are some examples to help you solve the problems in this section.

When graphing points in the coordinate plane, plot the ordered pair by starting at the origin (0,0) and then moving left(-) or right(+) to the x value then up(+) or down(-) for the y value.

When writing the ordered pair for a point on the coordinate plane, read the x value first then the y value. The ordered pair is written as (x, y)

Point A(-3, 2)

left 3, up 2

Point B(4, 0)

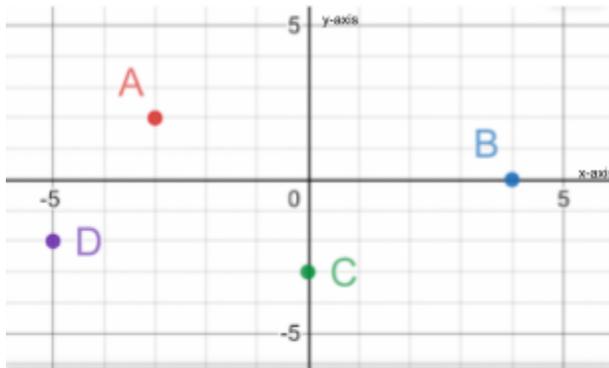
right 4, up 0

Point C(0, -3)

right 0, down 3

Point D(-5, -2)

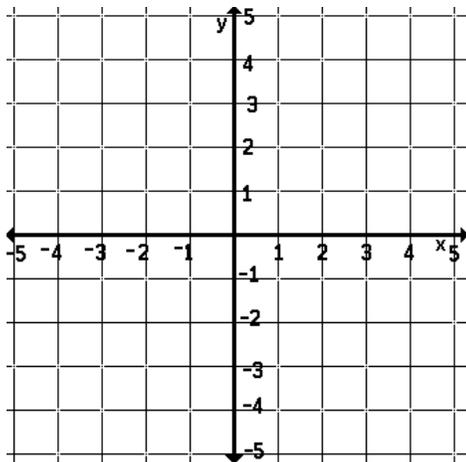
left 5, down 2



Problem Set

Directions: Plot the following points on the coordinate plane. Label with the given letter.

- 19. Point E (1, 1)
- 20. Point F (-2, 2)
- 21. Point G (-3, -3)
- 22. Point H (0, 1)



Directions: Write the ordered pair for the points in the given graph.

- 23. Point J _____
- 24. Point K _____
- 25. Point L _____

