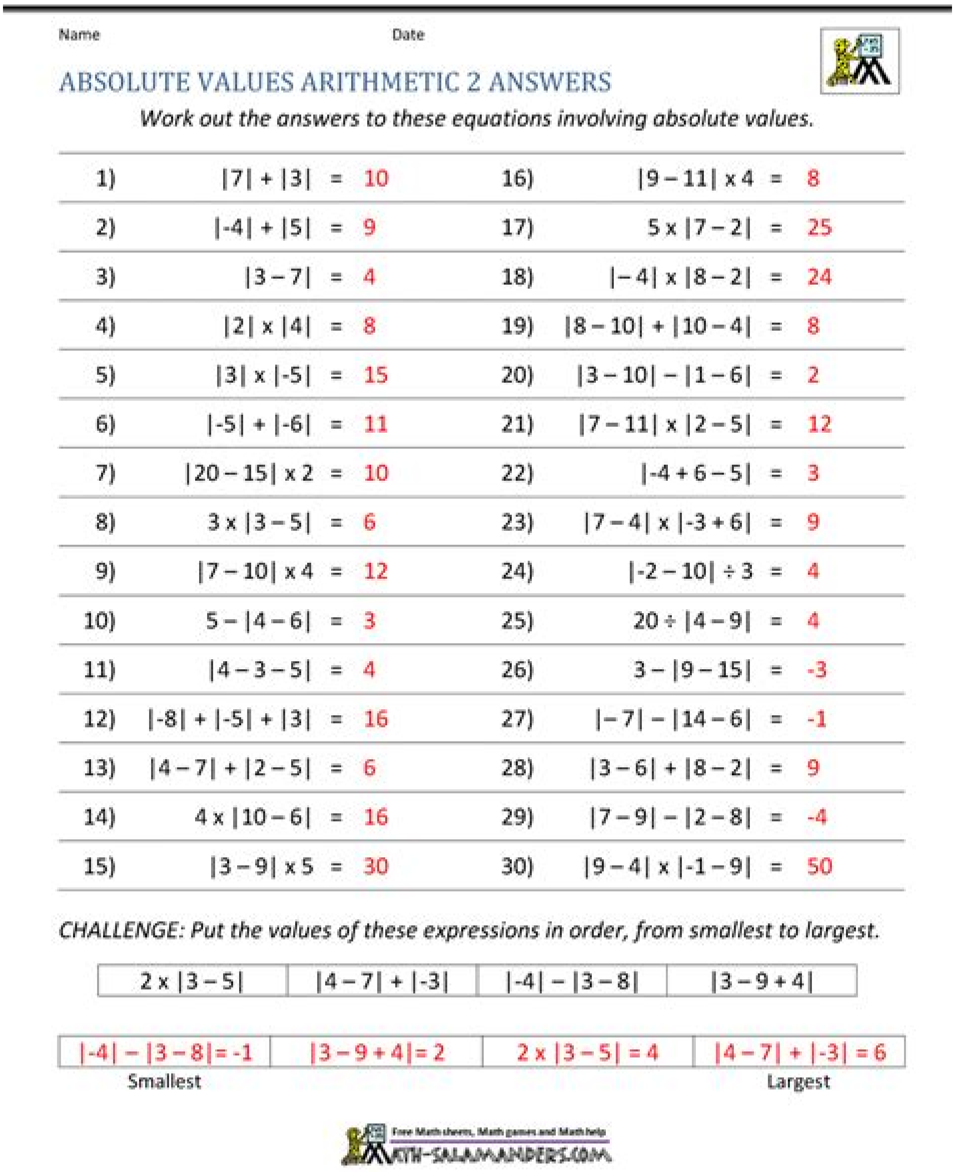
Order Of Operations With Absolute Value Worksheet



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ABSOLUTE VALUES ARITHMETIC 2 ANSWERS

Work out the answers to these equations involving absolute values.

1)	|7| + |3|	=	10	16)	|9 – 11| x 4	=	8
2)	|-4| + |5|	=	9	17)	5 x |7 – 2|	=	25
3)	|3 – 7|	=	4	18)	|– 4| x |8 – 2|	=	24
4)	|2| x |4|	=	8	19)	|8 – 10| + |10 – 4|	=	8
5)	|3| x |-5|	=	15	20)	|3 – 10| – |1 – 6|	=	2
6)	|-5| + |-6|	=	11	21)	|7 – 11| x |2 – 5|	=	12
7)	|20 – 15| x 2	=	10	22)	|-4 + 6 – 5|	=	3
8)	3 x |3 – 5|	=	6	23)	|7 – 4| x |-3 + 6|	=	9
9)	|7 – 10| x 4	=	12	24)	|-2 – 10| ÷ 3	=	4
10)	5 – |4 – 6|	=	3	25)	20 ÷ |4 – 9|	=	4
11)	|4 – 3 – 5|	=	4	26)	3 – |9 – 15|	=	-3
12)	|-8| + |-5| + |3|	=	16	27)	|– 7| – |14 – 6|	=	-1
13)	|4 – 7| + |2 – 5|	=	6	28)	|3 – 6| + |8 – 2|	=	9
14)	4 x |10 – 6|	=	16	29)	|7 – 9| – |2 – 8|	=	-4
15)	|3 – 9| x 5	=	30	30)	|9 – 4| x |-1 – 9|	=	50

CHALLENGE: Put the values of these expressions in order, from smallest to largest.

2 x |3 – 5|	|4 – 7| + |-3|	|-4| – |3 – 8|	|3 – 9 + 4|

|-4| – |3 – 8| = -1	|3 – 9 + 4| = 2	2 x |3 – 5| = 4	|4 – 7| + |-3| = 6
Smallest			Largest

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Order of operations with absolute value worksheet is a valuable resource for students learning to navigate mathematical expressions that include both absolute values and complex operations. Understanding how to correctly apply the order of operations is essential for solving equations accurately and efficiently. In this article, we will delve into the significance of the order of operations, explore absolute value, and provide guidance on how to create effective worksheets for practice.

Understanding the Order of Operations

The order of operations is a standardized set of rules that dictates the sequence in which mathematical operations should be performed. This is crucial for ensuring that expressions are evaluated consistently. The common mnemonic used to remember the order is PEMDAS, which stands for:

1. P - Parentheses
2. E - Exponents
3. M - Multiplication
4. D - Division
5. A - Addition
6. S - Subtraction

In this context, operations within parentheses are prioritized, followed by exponents, and then multiplication and division (from left to right), with addition and subtraction coming last (also from left to right).

Why the Order of Operations Matters

1. Consistency: Following the order of operations ensures that everyone arrives at the same answer when solving the same expression.
2. Complexity: As mathematical expressions grow in complexity, the order of operations becomes increasingly vital. Without a clear guideline, different evaluators may interpret and calculate expressions differently.
3. Foundation for Advanced Concepts: A strong grasp of the order of operations is necessary for tackling more advanced mathematical concepts, such as algebra, calculus, and beyond.

Exploring Absolute Value

Absolute value is a mathematical concept that refers to the non-negative value of a number regardless of its sign. The absolute value of a number \(x\) is denoted as |x|. For example:

- |5| = 5
- |-5| = 5
- |0| = 0

The absolute value represents the distance of a number from zero on the number line, making it a fundamental concept in mathematics. Understanding absolute value is crucial when it comes to solving equations and inequalities, particularly in the context of the order of operations.

Importance of Absolute Value in Expressions

When working with expressions that include absolute values, it’s essential to apply the order of operations correctly. This ensures that the absolute values are calculated before performing other operations. For example, consider the expression:

$|-3 + 4| \times 2$

To solve this, we first need to evaluate the expression inside the absolute value:

1. Calculate $-3 + 4 = 1$
2. Now evaluate $|1| = 1$
3. Finally, multiply: $1 \times 2 = 2$

If we had not prioritized the absolute value, the calculation could yield incorrect results.

Creating an Order of Operations with Absolute Value Worksheet

Creating an effective worksheet that combines the order of operations with absolute values can significantly aid students in mastering these concepts. Here’s a step-by-step guide to designing a worksheet.

Step 1: Define Learning Objectives

Before creating the worksheet, identify the key objectives you want to achieve. For example:

- Students will understand and apply the order of operations.
- Students will correctly evaluate expressions involving absolute values.

Step 2: Choose Appropriate Problems

Select a range of problems that vary in difficulty, ensuring they encompass both the order of operations and absolute values. Here’s a list of example problems:

- 1. |−2 + 3| × 4
- 2. 5 + |−7 + 2|
- 3. |8 − 10| ÷ 2 + 3
- 4. 6 × |−3| − 2
- 5. |4 + |−5| − 2|

Step 3: Provide Space for Solutions

Ensure that there is ample space for students to show their work. This encourages them to write out each step, reinforcing their understanding of the order of operations.

Step 4: Include Instructions

Clearly state the instructions at the top of the worksheet. For example:

"Evaluate each expression by following the order of operations. Be sure to calculate the absolute values first!"

Step 5: Add Answer Key

Providing an answer key is essential for both students and educators. It allows for self-checking and helps teachers assess the understanding of their students. Here’s the answer key for the example problems listed above:

- 1. 4 × 1 = 4
- 2. 5 + |−5| = 5 + 5 = 10
- 3. |−2| ÷ 2 + 3 = 2 ÷ 2 + 3 = 1 + 3 = 4
- 4. 6 × 3 − 2 = 18 − 2 = 16
- 5. |4 + 5 − 2| = |7| = 7

Tips for Using the Worksheet

1. Review the Concepts: Before distributing the worksheet, review the order of operations and absolute value with students to ensure they have a solid understanding.
2. Group Work: Consider allowing students to work in pairs or small groups. This encourages collaboration and discussion around solving the problems.
3. Encourage Showing Work: Remind students to write down each step of their calculations. This practice helps to identify any mistakes in their reasoning.
4. Feedback and Discussion: After completing the worksheet, hold a class discussion to go over the answers and the methods employed. This reinforces learning and clarifies any misunderstandings.

Conclusion

An **order of operations with absolute value worksheet** serves as a vital tool for students to practice and master these fundamental mathematical concepts. By understanding how to apply the order of operations correctly, especially when dealing with absolute values, students will enhance their problem-solving skills and build a strong foundation for more advanced mathematics. With careful planning and structured practice, educators can effectively guide their students through this essential aspect of mathematics.

Frequently Asked Questions

What is the purpose of using absolute value in order of operations worksheets?

The purpose is to teach students how to correctly evaluate expressions that include absolute values while following the order of operations, ensuring they understand how absolute values affect calculations.

How do you solve an expression like |3 + 2| × 4 using order of operations?

First, calculate the absolute value: |3 + 2| = |5| = 5. Then, multiply: 5 × 4 = 20.

Can you provide an example of a complex expression

involving absolute value and order of operations?

Sure! An example is |8 - (3 + 2)| ÷ 2. First, evaluate inside the parentheses: 3 + 2 = 5, then |8 - 5| = |3| = 3, and finally 3 ÷ 2 = 1.5.

What should students remember when dealing with negative numbers and absolute value in order of operations?

Students should remember that absolute value turns negative numbers into positive numbers, so they must evaluate expressions inside the absolute value brackets first before applying any further operations.

How can teachers create effective worksheets on order of operations with absolute value?

Teachers can create effective worksheets by including a variety of problems that mix different operations (addition, subtraction, multiplication, division) and varying levels of complexity, ensuring to integrate absolute value in different contexts.

What are some common mistakes students make when working with absolute value and order of operations?

Common mistakes include forgetting to evaluate the absolute value first, misapplying the order of operations by ignoring parentheses, or incorrectly interpreting the absolute value of negative results.

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