Adding and Subtracting Integers Answer Key

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Adding and subtracting integers is a fundamental skill in mathematics that lays the groundwork for more advanced concepts in arithmetic and algebra. Understanding how to manipulate positive and negative numbers is crucial for solving equations, interpreting data, and performing various calculations in daily life. This article will explore the principles and rules governing the addition and subtraction of integers, provide examples for clarity, and offer an answer key for practice problems.

Understanding Integers

Integers are whole numbers that can be either positive or negative, including zero. The set of integers can be expressed as:

- ...,-3, -2, -1, 0, 1, 2, 3,...

Integers do not include fractions or decimals. When working with integers, it is essential to grasp the concepts of positive and negative values, as they play a significant role in addition and subtraction.

Rules for Adding Integers

When adding integers, the following rules apply:

1. Adding Two Positive Integers

- When two positive integers are added, the sum is also positive.

Example:
3 + 5 = 8

2. Adding Two Negative Integers

- When two negative integers are added, the sum is negative.

Example:
-4 + (-6) = -10

3. Adding a Positive Integer and a Negative Integer

- When adding a positive integer and a negative integer, subtract the smaller absolute value from the larger absolute value. The sign of the result will be the same as the integer with the larger absolute value.

Example:
5 + (-3) = 2 (since 5 is larger)
-4 + 2 = -2 (since -4 is larger)

Rules for Subtracting Integers

Subtraction can be thought of as adding the opposite. Therefore, when subtracting integers, these rules apply:

1. Subtracting a Positive Integer

- To subtract a positive integer, add its opposite.

Example:
6 - 3 = 6 + (-3) = 3

2. Subtracting a Negative Integer

- To subtract a negative integer, add the positive equivalent of that integer.

Example:
5 - (-2) = 5 + 2 = 7

3. The Order Matters

- The order of integers is crucial in subtraction. Unlike addition, changing the order will result in a different answer.

Example:
3 - 5 = 3 + (-5) = -2, which is different from 5 - 3 = 2.

Visualizing Adding and Subtracting Integers

Visual aids can be particularly helpful when learning how to add and subtract integers. Number lines are one of the most effective tools for this purpose.

Using a Number Line

A number line is a straight line with numbers placed at equal intervals. Positive integers are typically placed to the right of zero, while negative integers are placed to the left.

- Adding Positive Integers: Move to the right.
- Adding Negative Integers: Move to the left.
- Subtracting Positive Integers: Move to the left.
- Subtracting Negative Integers: Move to the right.

Example: To calculate 4 + (-7):
1. Start at 4 on the number line.
2. Move 7 units to the left (since -7 is negative).
3. You land on -3.

Example: To calculate 3 - 5:
1. Start at 3.
2. Move 5 units to the left.
3. You land on -2.

Practice Problems

Engaging with practice problems is crucial to mastering adding and subtracting integers. Here are a few problems to work on:

1. 7 + (-2) = ?
2. -8 + 5 = ?
3. 12 - 9 = ?
4. -3 + (-6) = ?
5. 4 - (-3) = ?
6. -5 - 2 = ?
7. 10 + (-15) = ?
8. -7 - (-4) = ?

Answer Key

To ensure you understand how to add and subtract integers, here are the answers to the practice problems listed above:

1. 7 + (-2) = 5
- Explanation: Start at 7, move 2 units left.

2. -8 + 5 = -3
- Explanation: Start at -8, move 5 units right.

3. 12 - 9 = 3
- Explanation: Start at 12, move 9 units left.

4. -3 + (-6) = -9
- Explanation: Both are negative, so add their absolute values and keep the negative sign.

5. 4 - (-3) = 7
- Explanation: Subtracting a negative is the same as adding a positive.

6. -5 - 2 = -7
- Explanation: Start at -5, move 2 units left.

7. 10 + (-15) = -5
- Explanation: Start at 10, move 15 units left.

8. -7 - (-4) = -3
- Explanation: Subtracting a negative is the same as adding a positive.

Conclusion

Adding and subtracting integers is an essential aspect of mathematics that serves as the building block for more complex arithmetic and algebraic concepts. By understanding the rules and practicing with various problems, learners can build confidence in their ability to manipulate integers. Whether using a number line or applying the rules directly, the ability to add and subtract integers opens the door to a deeper understanding of mathematics. With consistent practice and application, anyone can master these foundational skills.

Frequently Asked Questions

What is the sum of -7 and 5?

-2

How do you subtract -4 from 3?

7

If you add 8 and -3, what is the result?

5

What is the result of -6 - 2?

-8

How do you calculate 10 + (-15)?

-5

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