Integer Rules

Integers are the set of whole numbers along with their opposites. Integers = { ... -3, -2, -1, 0, 1, 2, 3 ...}

The absolute value of a number and the absolute value of its opposite are the same. |6| = |-6| = 6

Addition:

Same signs: Add the absolute values of the numbers. The sum has the same sign as the given numbers.

\[ \begin{align*} + & + = + \quad \text{Example: } 6 + 7 = 13 \\ - & + = - \quad \text{Example: } -6 + -7 = -13 \end{align*} \]

Different signs: Find the difference of the absolute values of the numbers and take the sign of the larger number (i.e., the one larger in absolute value).

\[ \begin{align*} + & - = - \quad \text{Example: } 5 + -2 = 3 \quad \text{Example: } 2 + -8 = -6 \\ - & + = + \quad \text{Example: } -4 + 9 = 5 \quad \text{Example: } -7 + 5 = -2 \end{align*} \]

Subtraction:

Change the subtraction sign to an addition sign, and then change the sign of the second number to the opposite sign.

\[ \begin{align*} + & - = + + \quad \text{Example: } 3 - 2 = 3 + -2 = 1 \\ - & + = - + \quad \text{Example: } -9 - 11 = -9 + -11 = -20 \\ + & - = + + \quad \text{Example: } 4 - -5 = 4 + 5 = 4 + 5 = 9 \\ - & - = - + \quad \text{Example: } -6 - -10 = -6 + 10 = -6 + 10 = 4 \end{align*} \]

Multiplication:

The product of two numbers having the same sign is positive.

\[ \begin{align*} + & + = + \quad \text{Example: } 2(2) = 4 \\ - & - = + \quad \text{Example: } -3(-4) = 12 \end{align*} \]

The product of two numbers having different signs is negative.

\[ \begin{align*} + & - = - \quad \text{Example: } 3(-6) = -18 \\ - & + = - \quad \text{Example: } -1(7) = -7 \end{align*} \]

Division:

The quotient of two numbers having the same sign is positive.

\[ \begin{align*} + & + = + \quad \text{Example: } 6/3 = 2 \\ - & - = + \quad \text{Example: } -24/-12 = 2 \end{align*} \]

The quotient of two numbers having different signs is negative.

\[ \begin{align*} + & - = - \quad \text{Example: } 14/-7 = -2 \\ - & + = - \quad \text{Example: } -8/4 = -2 \end{align*} \]