

Operations With Signed Numbers

ADDITION - SUM $a + b$

$$\left. \begin{array}{l} 5 + 3 = 8 \\ (-5) + (-3) = -8 \end{array} \right\} \begin{array}{l} \text{Add in Absolute Value,} \\ \text{Keep the Sign} \end{array}$$

$$\left. \begin{array}{l} 7 + (-4) = 3 \\ (-7) + 4 = -3 \end{array} \right\} \begin{array}{l} \text{Subtract in Absolute Value,} \\ \text{Use the Sign of the Number that is Larger in Absolute Value} \end{array}$$

SUBTRACTION - DIFFERENCE $a - b$

$$8 - 2 = 6$$

$$\left. \begin{array}{l} 5 - 7 = 5 + (-7) = -2 \\ -6 - 3 = -6 + (-3) = -9 \end{array} \right\} \text{Subtracting a number is the same as Adding its Opposite.}$$

$$\left. \begin{array}{l} 6 - (-2) = 6 + 2 = 8 \\ -8 - (-6) = -8 + 6 = -2 \end{array} \right\} \text{Change the two '—' signs to an addition sign. i.e. '- -' → +}$$

MULTIPLICATION - PRODUCT $a \times b, a \cdot b, ab, a * b, a(b), (a)(b), (a)b$

$$\left. \begin{array}{l} (+)(+) = + \\ (-)(-) = + \end{array} \right\} \text{If the Signs are the SAME, then their product is POSITIVE}$$

$$\left. \begin{array}{l} (+)(-) = - \\ (-)(+) = - \end{array} \right\} \text{If the Signs are OPPOSITES, then their product is NEGATIVE}$$

$$(-1)(-2)(-3)(-4) = 24 \quad \text{If you have an EVEN number of '-' signs, then their product is POSITIVE}$$

$$(-1)(-2)(-3)(4) = -24 \quad \text{If you have an ODD number of '-' signs, then their product is NEGATIVE}$$

DIVISION - QUOTIENT $a \div b, a / b, \frac{a}{b}, b \overline{)a}$

$$\frac{+}{+} = + \quad \text{or} \quad \frac{-}{-} = + \quad \text{If the Signs are the SAME, then their quotient is POSITIVE}$$

$$\frac{+}{-} = - \quad \text{or} \quad \frac{-}{+} = - \quad \text{If the Signs are OPPOSITES, their quotient is NEGATIVE}$$

$$\frac{0}{2} = 0 \quad \text{Zero in the NUMERATOR, the fractional value is ZERO}$$

$$\frac{2}{0} \text{ is Undefined} \quad \text{Zero in the DENOMINATOR, the expression is UNDEFINED}$$

$$\frac{-1}{2} = \frac{1}{-2} = -\frac{1}{2} \quad \text{If ONLY ONE of the numbers is NEGATIVE, their quotient is NEGATIVE}$$