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SIGN RULES for Addition, Subtraction, Multiplication and Division

For Multiplication and Division:

If the signs are the *same* the result is *positive*.

If the signs are *different* the result is *negative*.

Multiplication examples:

$$\begin{array}{l} POS \times POS = POS \\ (2)(3) = 6 \end{array}$$

$$\begin{array}{l} NEG \times NEG = POS \\ (-2)(-3) = 6 \end{array}$$

$$\begin{array}{l} POS \times NEG = NEG \\ (2)(-3) = -6 \end{array}$$

$$\begin{array}{l} NEG \times POS = NEG \\ (-2)(3) = -6 \end{array}$$

Division examples:

$$\begin{array}{l} \frac{POS}{POS} = POS \\ \frac{6}{3} = 2 \end{array}$$

$$\begin{array}{l} \frac{NEG}{NEG} = POS \\ \frac{-6}{-3} = 2 \end{array}$$

$$\begin{array}{l} \frac{POS}{NEG} = NEG \\ \frac{6}{-3} = -2 \end{array}$$

$$\begin{array}{l} \frac{NEG}{POS} = NEG \\ \frac{-6}{3} = -2 \end{array}$$

Addition: Note that the *magnitude* of a signed number is the same as its *absolute value*.

When adding a *positive* number and a *positive* number:

$$7 + 4 = 11$$

Add the magnitudes.
Result is positive.

When adding a *negative* number and a *negative* number:

$$-7 + (-4) = -11 \quad (7+4=11, \text{ result is } \textbf{negative})$$

Add the magnitudes.
Result is negative.

When adding a *positive* number and a *negative* number:

$$-7 + 4 = -3 \quad (7-4=3, \text{ the result is } \textbf{negative} \text{ from the } -7)$$

$$7 + (-4) = 3 \quad (7-4=3, \text{ the result is } \textbf{positive} \text{ from the } 7)$$

Subtract the smaller magnitude from the larger. **The sign of the result is the same as the number that had the larger magnitude.**

Subtraction: *Change* the subtraction sign to addition, and *flip* the sign of the second number. Then *add* the numbers. (This is the *definition of subtraction* or *two-stroke rule*.)

$$7 - 4 \quad \text{becomes} \quad 7 + (-4) = 3$$

$$-7 - (-4) \quad \text{becomes} \quad -7 + 4 = -3$$

$$-7 - 4 \quad \text{becomes} \quad -7 + (-4) = -11$$

$7 - (-4)$ becomes $7 + 4 = 11$ *(The subtraction examples became the addition examples.)*