Addition and Subtraction

What is addition?
- **Addition** means move to the _______ on the number line.

What is subtraction?
- **Subtraction** means move to the _______ on the number line.

Recall: Adding a negative number is the same as ______________ the opposite of that number.

Example 1:

\[3 + (-4)\]

\[= \underline{\hspace{2cm}}\]

\[= \underline{\hspace{2cm}}\]

Recall: Subtracting a negative number is the same as ______________ the opposite of that number.

Example 2:

\[-4 - (-5)\]

\[= \underline{\hspace{2cm}}\]

\[= \underline{\hspace{2cm}}\]

Recall: when adding and subtracting terms, they must be like terms.
Example 3:

\[
\frac{-5}{6} + \frac{1}{3}
\]

We must find the lowest common denominator (the \textit{LCD}).

\[
\text{\textit{LCD}} = \text{________} 
\]

Solution:

\[
\frac{-5}{6} + \frac{1}{3} = \frac{-5}{6} + \frac{1}{3} \left(\frac{2}{2}\right)
\]

\[
\frac{-5}{6} + \frac{2}{6}
\]

\[
\frac{-5+2}{6}
\]

\[
\frac{3}{6} = \frac{1}{2}
\]
Example 4:

\[
\frac{5}{8} - \left( -\frac{3}{4} - \frac{1}{2} \right)
\]

Solution:

\[
\frac{5}{8} - \left( -\frac{3}{4} - \frac{1}{2} \right)
= \frac{5}{8} - \left( -\frac{3}{4} \cdot \frac{2}{2} \right)
= \frac{5}{8} - \left( -\frac{6}{8} - \frac{4}{8} \right)
= \frac{5}{8} - \left( -\frac{10}{8} \right)
= \frac{5}{8} + \frac{10}{8}
= \frac{15}{8}
\]

Recall: The word sum indicates addition. The word difference indicates subtraction.
Example 5:

Write the numerical expression for the phrase the sum of $5, -3$ and $-7$ and then simplify.

Solution:

$5 + (-3) + (-7)$

$= 5 - 3 - 7$

$= 2 - 7$

$= -5$

Example 6:

Write a numerical expression for the phrase the difference of $7$ and $-10$ and then simplify.

Solution:

$7 - (-10)$

$= 7 + 10$

$= 17$

**NOTE:** Order is important!
Addition and Subtraction

Practice Problems

1. Evaluate: \(4 - (-7) + (-3)\)

2. Evaluate: \(\frac{-3}{2} - \left(-\frac{1}{3}\right) + \left(-\frac{5}{6}\right)\)

3. Write a numerical expression for each phrase and simplify:
   a) 4 more than the sum of \(-8\) and \(-3\).
   b) 12 less than the difference of 7 and \(-6\).