Consider the following set of numbers:
\[ \left\{ -9, -\frac{3}{5}, 0, 0.25, \sqrt{2}, 8.9, \sqrt{25} \right\} \]

All lie on a number line.

- Natural \#s \{ \sqrt{25} = 5 \}
- Whole \#s \{ 0, \sqrt{25} = 5 \}
- Integers \{ -9, 0, \sqrt{25} = 5 \}
- Rational \{ \text{Fractions} \} \{ -9, -\frac{3}{5}, 0, 0.25, 8.9, \sqrt{25} = 5 \}
  \[ \frac{44}{\overline{22}} \text{ Repeating} \]
  \[ 0.013 \overline{57} \]

- Irrational \# \{ \sqrt{2} \}
  \[ 0.12/22/222... \]

- Real \# \text{ All !!}
$6 + 8 = 14$
$6 + (-8) = -2$
$-6 + 8 = 2$
$-6 + (-8) = -14$
1.7 Subtraction of Real Numbers

1 Subtract numbers.  
2 Subtract numbers mentally.  
3 Evaluate expressions containing more than two numbers.

### Subtract Numbers

Any subtraction problem can be rewritten as an addition problem using the additive inverse.

#### To Subtract Real Numbers

In general, if $a$ and $b$ represent any two real numbers, then

$$ a - b = a + (-b) $$

This rule says that to subtract $b$ from $a$, add the opposite or additive inverse of $b$ to $a$.

$$ 4 - 7 = 4 + (-7) = -3 $$
$$ -4 - 7 = -4 + (-7) = 11 $$
$$ 4 - (-7) = 4 + (7) = 11 $$
$$ -4 - (-7) = -4 + (7) = 3 $$
$$ 11 - 6 = 11 + (-6) = 5 $$
$$ 11 - (-6) = 11 + (6) = 17 $$
$$ -11 - 6 = -11 + (-6) = -17 $$
$$ -11 - (-6) = -11 + (6) = -5 $$

Tic-Tac-Toe

$$ -6 + -8 = -14 $$
$$ -6 + (+8) = 2 $$
$$ 6 + -8 = -2 $$
$$ 6 + (+8) = 14 $$

$$ 8 - 5 = 3 $$
$$ 8 + (-5) = 3 $$
$$ 8 - (-5) = 8 + (5) = 13 $$
\[
13 + 7 =
\]
\[
13 + (-7) =
\]
\[
-13 + 7 =
\]
\[
-13 + (+7) =
\]
\[
7 - 11 = \quad 7 + (-11) = -4
\]
\[
-7 - 11 = \quad -7 + (-11) = -18
\]
\[
7 - (-11) = \quad 7 + (+11) = 18
\]
\[
-7 - (-11) = \quad -7 + (+11) = 4
\]
Rewriting Expressions

In general, for any real numbers $a$ and $b$,

\[ a + (-b) = a - b, \text{ and} \]
\[ a - (-b) = a + b \]

\[ \frac{p}{4} + \frac{p}{3} + \frac{n}{7} + \frac{p}{4} + \frac{n}{2} + \frac{3}{2} \]

\[ 14 + -9 \]

\[ (-) \]

\[ \frac{-8 + (+3)}{-4 + 2 + (-2) - (-5)} \]

\[ -5 + 4 \]

\[ -9 + 2 \]

\[ -7 + (-2) \]

\[ -9 + (+5) \]

\[ -4 \]

\[ \left\{ \begin{array}{c}
- + \\
- - \\
+ + \end{array} \right\} \text{ Toward Negative Sign} \]

\[ \left\{ \begin{array}{c}
+ - \\
- - \end{array} \right\} \text{ Toward Positive Sign} \]

\[ 8 - (-2) = 10 \]

\[ 8 - 2 = 6 \text{ Toward Positive Side} \]

\[ -8 - (-2) = -6 \]

\[ -8 - 2 = -10 \]
16. \(9 - 4 = 9 + (-4) = 5\)
20. \(17 - (-5) = 17 + (5) = 22\)
24. \(9 - (-9) = 9 + (9) = 18\)
28. \(-5.7 - (-3.1)\)
32. \(6 - 10 = 6 + (-10) = -4\)
36. \(-6.3 - 4.7\)
40. \(9 - 9 = 9 + (-9) = 0\)
44. \(-25 - 16\)

\[
72. \frac{5}{12} - \frac{7}{8}
\]

\[
76. \frac{5}{4} - \frac{7}{11}
\]

\[
80. \frac{17}{18} - \frac{13}{20}
\]

\[
84. \frac{5}{12} - \left(\frac{3}{8}\right)
\]

88. Subtract \(-\frac{5}{16}\) from \(-\frac{9}{10}\).

\[
\frac{5}{12} - \frac{7}{8}
\]

\[
\frac{10}{24} + \left(\frac{-21}{24}\right)
\]

\[
\frac{5\times\frac{2}{2}}{2} = \frac{10}{24}
\]

\[
\frac{7\times\frac{3}{3}}{2} = \frac{21}{24}
\]

\[
\text{Subtract 7 from 5,}\quad 5 - 7 = -2
\]
134. **Death Valley** A medical supply package is dropped into Death Valley, California, from a helicopter 1605.7 feet above sea level. The package lands at a location in Death Valley 267.4 feet below sea level. What vertical distance did the package travel?