Adding Integers
Example 1  Evaluate.

\[-6 + (-14) = \]
Example 2 Evaluate.

\[-5 + 12 =\]
Adding Integers

**Example 3** Evaluate.

\[ 8 + (-20) = \]
Subtracting Integers
Subtracting Integers

Change the subtraction symbol to addition, and change the sign of the number being subtracted.

**Example 1** Evaluate.

23 − (−14) =
Example 2  Evaluate.

17 − 26 =
Multiplying and Dividing Integers
Multiplying and Dividing Integers

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

• The product of two numbers having different signs is negative.

Example 1 Evaluate.

(a) \(-8(7) =\)

(b) \(-3(-9) =\)
Multiplying and Dividing Integers

• The quotient of two numbers having the same sign is positive.
• The quotient of two numbers having different signs is negative.

**Example 2** Evaluate.

(a) \[ \frac{-24}{-6} = \]
(b) \[ \frac{50}{-25} = \]
Order of Operations with Integers
Order of Operations with Integers

Parentheses
Exponents
Multiplication
Division
Addition
Subtraction

In order of appearance, from left to right

Example 1  Evaluate.

\[-3 - 2(5 - 10) + (-15) =\]
Example 2  Evaluate.

\[
\frac{(-3)^2 - 15}{6 + (-4)} =
\]
Order of Operations with Integers
Order of Operations with Integers

- Parentheses
- Exponents
- Multiplication
- Division
- Addition
- Subtraction

In order of appearance, from left to right

Example 1  Evaluate.

\[-3 - 2(5 - 10) + (-15) = \]
Example 2 Evaluate.

\[
\frac{(-3)^2 - 15}{6 + (-4)} =
\]
Simplifying Fractions
Simplifying Fractions

Divide the numerator and denominator by their greatest common factor to obtain an equivalent fraction in lowest terms.

*Example* Simplify.

(a) \( \frac{28}{40} \)

(b) \( \frac{54}{9} \)
Adding and Subtracting Fractions
Adding and Subtracting Fractions

1. Rewrite the fractions, as needed, so that they have a common denominator (i.e., a number that is divisible by all denominators).
2. Add or subtract numerators; keep the denominator the same.

Example 1  Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{4}{5} - \frac{1}{3} = \]
**Example 2** Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{1}{6} + \frac{1}{12} =
\]
Example 3  Perform the indicated operations, expressing final answer as a simplified fraction.

\[ \frac{1}{20} + \frac{1}{12} = \]
Multiplying Fractions
**Example 1** Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}
\]
Example 2  Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{2}{7} \cdot \frac{5}{6} = \]

Multiplying Fractions
Dividing Fractions
Dividing Fractions

Rewrite the division symbol as multiplication, and rewrite the divisor as its reciprocal.

**Example 1** Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{4}{3} \div \frac{3}{2} = \]

Example 2  Perform the indicated operations, expressing final answer as a simplified fraction.

$$\frac{3}{7} \div \frac{2}{7} =$$
Example 3 Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{6}{2} = \frac{3}{12}
\]
Example 4 Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{7}{4} = \frac{15}{15}
\]
Order of Operations with Fractions
Order of Operations with Fractions

Parentheses (i.e., numerators and denominators separately)
Exponents
Multiplication
Division
Addition
Subtraction

In order of appearance, from left to right

Example 1 Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{4 - 10}{4 \cdot 10} =
\]
Order of Operations with Fractions

**Example 2** Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{1}{3-5} + \frac{1}{3+5} =
\]
Example 3  Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\left( \frac{2}{5} - \frac{9}{10} \right) \div 3 =
\]
Example 4 Perform the indicated operations, expressing final answer as a simplified fraction.

\[
\frac{3}{4} - \frac{3}{14} = \frac{3}{3}
\]
Evaluating Expressions at Specified Values
Example 1  Let a = 7, b = −4, and c = 2. Evaluate the expression below, expressing final answer as a simplified integer.

\[ b^2 - 4ac = \]
**Example 2** Let $p = -2$, $r = -5$, and $t = 2$. Evaluate the expression below, expressing final answer as a simplified fraction.

\[
\frac{p^2 - 2t}{r + t}
\]