

Chapter 1
Section 1.1
Use the Language of Algebra

Definition:

Variable –

Constant –

Definition:

Inequality Symbols:

Expression –

Equation –

Exponential Notation –

Order of Operations –

1. Simplify:

a) $30 \div 5 + 10(3 - 2)$

b) $9 + 5^3 - [4(9 + 3)]$

Definition:

Evaluate an expression –

2. Evaluate when $x = 3$:

a) x^2

b) 4^x

c) $3x^2 + 4x + 1$

Definition:
Term –

Coefficient –

Like Terms –

3. Simplify:

$$3x^2 + 7x + 9 + 7x^2 + 9x + 8$$

Key Words:

- Addition –

- **Subtraction –**

- **Multiplication –**

- **Division –**

4. Translate the English phrase into an algebraic expression:
- a) The difference of $14x^2$ and 13

- b) The quotient of $12x$ and 2

c) 13 more than z

d) 18 less than $8x$

5. Translate the English phrase into an algebraic expression:

a) Four times the sum of p and q

b) Two times the difference of x and 8

6. The length of a rectangle is 7 less than the width. Let w represent the width of the rectangle. Write an expression for the length of the rectangle.

7. Lauren has dimes and nickels in her purse. The number of dimes is three more than seven times the number of nickels. Let n represent the number of nickels. Write an expression for the number of dimes.

Section 1.2

Integers

Definition:

Absolute Value –

1. Fill in $<$, $>$, or $=$ for each of the following pairs of numbers:

a) -9 _____ $-|-9|$

b) 2 _____ $-|-2|$

c) -8 _____ $-|-8|$

d) $-(-9)$ _____ $-|-9|$

Definition:

Grouping Symbols:

- **Parenthesis** ()
- **Brackets** []
- **Braces** { }
- **Absolute Value** | |

2. Simplify:

a) $19 - |11 - 4(3 - 1)|$

b) $8 - (-3 - 1) - 9$

3. Evaluate $3x^2 - 2xy + 6y^2$ when $x = 1$ and $y = -2$

Section 1.3

Fractions

Definition:

Equivalent Fraction Property:

If a, b , and c are numbers where $b \neq 0, c \neq 0$, then

$$\frac{a}{b} = \frac{a \cdot c}{b \cdot c} \quad \text{and} \quad \frac{a \cdot c}{b \cdot c} = \frac{a}{b}$$

1. Simplify:

$$-\frac{69}{192}$$

Definition:

Fraction Multiplication:

If a, b , and c are numbers where $b \neq 0, c \neq 0$, then

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

2. Multiply:

$$\frac{11}{3}(-9a)$$

Definition:**Fraction Division:**

If a, b , and c are numbers where $b \neq 0, c \neq 0$ and $d \neq 0$, then

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$$

3. Divide:

$$-\frac{5}{14} \div \left(-\frac{15}{28}\right)$$

Definition:**Complex Fraction –**

4. Simplify:

$$\frac{\frac{a}{8}}{\frac{ab}{6}}$$

Definition:**Fraction Addition and Subtraction:**

If a, b , and c are numbers where $c \neq 0$, then

$$\frac{a}{c} \pm \frac{b}{c} = \frac{a \pm b}{c}$$

Least Common Denominator (LCD) –

5. Add:

$$\frac{7}{12} + \frac{11}{15}$$

6. Simplify:

a) $\frac{3a}{4} - \frac{8}{9}$

b) $\frac{3a}{4} \cdot \frac{8}{9}$

7. Simplify:

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

8. Simplify:

$$\frac{1 + 4^2}{\left(\frac{1}{4}\right)^2}$$

9. Simplify:

$$\frac{\frac{2}{3} - \frac{1}{2}}{\frac{1}{4} + \frac{1}{3}}$$

10. Evaluate $3ab^2$ when $a = -\frac{2}{3}$ and $b = -\frac{1}{2}$

Section 1.5

Properties of Real Numbers

Definition:

Commutative Property:

- **of Addition –**

- **of Multiplication –**

Definition:

Associative Property:

- **of Addition –**

- **of Multiplication –**

1. Simplify:

$$23r + 14s + 9r + 15s$$

2. Simplify:

$$\left(\frac{7}{15} + \frac{5}{8}\right) + \frac{3}{8}$$

Definition:

Identity Property:

- **of Addition –**

- **of Multiplication –**

Inverse Property:

- of Addition –

- of Multiplication –

Properties of Zero:

- Multiplication by Zero –

- Division by Zero –

3. Simplify:

$$-27a + (-48a) + 27a$$

4. Simplify:

$$\frac{9}{16} \cdot \frac{5}{49} \cdot \frac{16}{9}$$

5. Simplify:

a) $\frac{0}{m+7}$

b) $\frac{16-6c}{0}$

Definition:
Distributive Property –

6. Simplify:

a) $4(x + 2)$

b) $12\left(\frac{1}{3}n + \frac{3}{4}\right)$

c) $100(0.7 + 0.15p)$

d) $-5(2 - 3a)$

e) $-(z - 11)$

f) $9 - 3(x + 2)$

g) $6(x - 9) - (x + 12)$