Chapter 1

Equations and Inequalities

Section 1.1   Expression and Formulas

Variable:

Coefficient:

Constant:

Algebraic Expression:

Order of Operations - PEMDAS

1.

2.

3.

4.

Let's Practice...

Evaluate each expression if *a* = -2, *b* = 3, and *c* = 4.

1. $2a + (b + 3)^2$	2. $a + 3(b^2 - (a + c))$	3. $5c - 2[(b - a) + c]$

Evaluate each expression if *a* = -2, *b* = 3, and *c* = 4.

4. $c\left(a^2 + b\right)$	5. $\dfrac{b^3 + ac}{ab + 2bc}$	6. $\dfrac{9a - 2c}{4ab}$

Let's practice…

A player's attack percentage *a* is calculated using the formula $a = \dfrac{k - e}{t}$, where *k* represents the number of kills, *e* represents the number of attack errors including blocks, and t represents the totals attacks attempted. Find the attack percentage given each set of values.

7. *k* = 22, *e* = 11, *t* = 35	8. *k* = 33, *e* = 9, *t* = 50

Section 1.2 Properties of Real Numbers

Set of Real Numbers (R)

Natural numbers (N)

Whole numbers (W)

Integers (Z)

Rational numbers (Q)

Irrational numbers (I)

Property	Addition	Multiplication
Commutative		
Associative		
Identity		
Inverse	Additive Inverse	Multiplicative Inverse or Reciprocal
Closure		
Distributive		

Name the sets of numbers to which each belong.

62	$\dfrac{5}{4}$	$\sqrt{11}$	-12

Name the property illustrated by each equation.

$(6\cdot 8)\cdot 5 = 6(8\cdot 5)$
$7(9-5) = 7\cdot 9 - 7\cdot 5$
$84 + 16 = 16 + 84$

The additive inverse of $\dfrac{4}{9}$ is _____, the multiplicative inverse or reciprocal is _____.

Simplify.

$3(2x-4y)+7(8x-5)$	$-5(8x-2y)-4(-6x-3y)$

Section 1.3 Solving Linear Equations

Equation:

Sum:

Difference:

Product:

Quotient:

Property	Examples
Reflexive	
Symmetric	
Transitive	
Substitution	

Let's Practice...

Write an algebraic expression to represent each verbal expression.

1. the product of 12 and the sum of a number and negative 3

2. The difference between the product of 4 and a number and the square of the number.

Write a verbal sentence to represent the following: $\dfrac{x}{4} + 8 = -16$

Solve the equations.

1. $\dfrac{2}{9}x + 8 = 16$

2. $12x - 3 = 4x + 21$

3. $5(x - 2) = 6 - (2x - 1)$

4. $\dfrac{2}{3}x + \dfrac{1}{4} = x - \dfrac{1}{6}$

5. Solve for q in the following equation: $\dfrac{8r - 5q}{2} = 3$

Section 1.4 Solving Absolute Value Equations

The absolute value | | of a number is _____ .

|a| = a , if

|a| = - a (opposite of a) , if

| x | = 5   ⟵————————————————⟶

Let's Practice… **Evaluate when x = -4 and y = -9.**

a. $\lvert 4x + 3 \rvert - 7$	b. $-3\lvert xy \rvert$	c. $-2\lvert 3x + 8 \rvert - 4$

Solve: | 6x – 3 | = 15	Solve: $2\lvert 4x + 3 \rvert - 5 = 15$

Section 1.5 Solving Linear Inequalities

Important

Multiplying **or** dividing each side of an inequality by a **negative** number requires you to **reverse** the inequality symbol**.**

Let's practice...
Solve each inequality and graph the solution set on a number line.

a. $11y - 9 > 13$	**b.** $-4w - 13 > -21$
c. $7x + 9 \geq 10x - 12$	**d.** $\dfrac{2x - 9}{4} \leq x + 2$

e. Tara is delivering bags of mulch. Each bag weighs 48 pounds and the push cart weighs 65 pounds. If her truck is capable of hauling 1 ton, how many bags of mulch can she safely take on each trip?

Section 1.6 Algebra Lab

Set Builder Notation vs. Interval Notation

Open circle →( )

Closed circle → [   ]

If **or** is used, the union ∪ symbol is used in place of **or**.

	Set Builder Notation	Interval Notation	Graph
1.	$\{x \le -5\}$		
2.	$\{-9 < x < 7\}$		
3.		$[-4, \infty)$	
4.		$(-\infty, 6) \cup (8, \infty)$	
5.	$\{x \le -3 \ or \ x \ge 5\}$		
6.		$(4, 9)$	

Section 1.6 Solving Linear Inequalities

Multiplying **or** dividing each side of an inequality by a **negative** number requires you to **reverse** the inequality symbol**.**

Part One: Compound Inequalities

A compound inequality consists of _____ .

Let's practice…

Solve each inequality and graph the solution set on a number line.

a. $-8 < 3t + 4 < 10$	b. $-5 \geq 3x - 2 > -14$
c. $-2x + 7 < 3$ or $3x + 5 < 2$	d. $5x \geq 15 \; or \; -3x \geq 21$

Part Two: Absolute Value Inequalities

$|x| < 4$

$|x| \geq 4$

Let's practice...

Solve each absolute value inequality.

a. $\left| 4x-7 \right| -2 > 17$	**b.** $\left| 5x-2 \right| +3 < 17$
c. $\left| 4x-7 \right| -2 > 17$	**d.** $2\left| 4x+3 \right| -5 > 15$