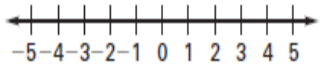
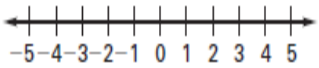
1.1	Real Numbers and Number Operations
Objectives	1. Use a number line to graph and order real numbers. 2. Identify properties of real numbers and use real numbers in application problems.
Key Terms	Origin Graph Coordinate Opposite Reciprocal Unit Analysis
Subsets of the Real Numbers	Whole Numbers Integers Rational Numbers Irrational Numbers

Graphing Numbers on a Number Line	½ , 2, $\frac{13}{4}$, -3, -5  0, $\frac{-12}{5}$, $-\sqrt{12}$, 0.3, -1.5  *Once the numbers are graphed, then comparisons can be made between the numbers or the numbers can be written in increasing order.
Properties of Addition and Subtraction	Let a, b, and c be real numbers **Property** — **Addition** — **Multiplication** **CLOSURE** — a + b is a real number. — ab is a real number. **COMMUTATIVE** — a + b = b + a — ab = ba **ASSOCIATIVE** — (a + b) + c = a + (b + c) — (ab)c = a(bc) **IDENTITY** — a + 0 = a, 0 + a = a — a· 1= a, 1· a = a **INVERSE** — a + (-a) = 0 — a $\cdot\frac{1}{a}$ = 1, a ≠ 0 The following property involves both addition and multiplication. **DISTRIBUTIVE** a(b + c) = ab + ac
Identify the Property Shown	-9 + 9 = 0 — (7 + 3) + 5 = 7 + (3 + 5) — 3(4 + 8) = 3 · 4 + 3 · 8

Unit Analysis	Change 80 feet/second to miles/hour. $$\frac{80\ feet}{1\ second} \cdot \frac{\quad}{\quad} \cdot \frac{\quad}{\quad} \cdot \frac{\quad}{\quad} = \frac{miles}{hour}$$ You are exchanging $250 for pesos. The exchange rate is 8.5 pesos per dollar. How many pesos will you receive?

1.2	**Algebraic Expressions and Models**
Objectives	1. Evaluate algebraic expressions. 2. Simplify algebraic expressions by combining like terms.
Key Terms	Numerical expression Base Exponent Order of Operations Variable Like Terms
Evaluating Powers	$\boldsymbol{Base^{Exponent} = Power}$ The base is used as a factor the exponent number of times. -5^4 $(-5)^4$ 2^3

Order of Operations	P E M or D A or S
Simplify the Expression	$3 + 4(8 + 5)^2$ $-5^2 - 8(1 - (-3))^3$
Simplifying Algebraic Expressions	$\boldsymbol{5x - 3x + 4}$ • There are ____ terms in this expression. (Connected by + or -) • The coefficients are _____, _____, and _____. (The numbers in front of the variables) • Like terms are _____. • The constant term(s) is (are):_____ **Simplify:** $4(x + 2) - 2(x + 2)$ $-9x - x - 7x^2$
You have $40 and are buying books that cost $12 each. Write an expression that shows how much money you have left after buying n books.	

1.3	Solving Linear Equations
Objectives	1. Solve linear equations. 2. Use linear equations to solve real life problems.
Key Terms	Equation Linear Equation Solution
Transformations that Produce Equivalent Equations	***Addition Property of Equality*** Add the same number to both sides. If a = b, then_____. ***Subtraction Property of Equality*** Subtract the same number from both sides. If a = b, then_____. ***Multiplication Property of Equality*** Multiply both sides by the same nonzero number. If a = b and c≠ 0, then_____. ***Division Property of Equality*** Divide both sides by the same nonzero number. If a = b and c≠ 0, then_____.
Solve the Equation.	$\frac{2}{9}x + 8 = 16$ 12x – 3 = 4x +21

	$5(x - 2) = -4(2x + 7) + x$ $\frac{2}{3}x + \frac{1}{5} = 2x - \frac{3}{10}$
A waitress has a base salary of $3 per hour and makes $15 per hour in tips. How many hours must she work to make $135?	Verbal Model Algebraic Model Solve
A car salesperson's base salary is $25,000. She earns 5% commission on sales. How much must she sell to earn $70,000 total?	

1.4	**Rewriting Equations and Formulas**
Objectives	1. Rewrite equations with more than one variable. 2. Rewrite common formulas.
Solve the equation for y.	11x – 9y = -4 -xy + 3x = 30 6x – 5y – 44 =0
	Common Formulas are listed on Page 28 of the text book.
Solve the formula for the indicated variable.	**Area of a Triangle** A = $\frac{1}{2}bh$, solve for h. **Perimeter of a Rectangle** P = 2ℓ + 2w, Solve for ℓ. **Area of a Circle** A = π r, solve for r.

1.5	Problem Solving Using Algebraic Model
Objectives	1. Use a general problem solving plan to solve real life problems. 2. Use other problem solving strategies to help solve real life problems.
Key Terms	Verbal Model Algebraic Model
General Problem Solving Plan	Write a verbal model → Assign Labels → Write an algebraic model → Solve the algebraic model → Answer the question
Corporate average fuel economy standards require auto manufacturers to produce cars that the average fuel efficiency between all of its car models is at least 27.5 mpg. Your new car travels about 358 miles on 11 gallons of gas. Is your car above or below the standard?	

You used all of a $50 gift certificate watching movies at the local theatre. You want to know how much you spent watching evening showings. Afternoon showings are $4 and evening showings are $6. You have seen a total of 10 movies.	
A car and a truck are 245 miles apart travelling towards each other until they meet. The car averages 65 mph and the truck averages 55 mph. After how long (time) do they meet? How many miles have each travelled?	
The table gives the heights to the top of the first few layers of bricks in a wall. Determine the height of 18 layers.	

Layer	Foundation	1	2	3	4
Height to top of layer (in.)	2	7	12	17	22

1.6	**Solving Linear Inequalities**
Objectives	1. Solve simple inequalities. 2. Solve compound inequalities.
Key Terms	Linear Inequality Solution Graph of an inequality Compound Inequality
Transformations that Produce Equivalent Inequalities	• Add the same number to both sides. • Subtract the same number from both sides. • Multiply both sides by the same positive number. • Divide both sided by the same positive number. • Multiply both sides by the same ***NEGATIVE*** number and ***REVERSE*** the inequality. • Divide both sides by the same ***NEGATIVE*** number and ***REVERSE*** the inequality.
Graphing Inequalities	• Use an ***OPEN DOT*** for > or < . • Use a ***CLOSED DOT*** for ≥ or ≤ . • Shade the number line to show all solutions of the inequality.
Solve and Graph	$5x + 7 > -3$ $-2x + 5 \leq -1$

	$2x - 2 \geq 3x + 1$ $9 - 6x < 9 + 2x$
A basketball player's average point total A is the last 5 games is $\frac{x+123}{5}$ where x is his score in the fifth game. Describe the scores x that will give him an average of at least 30 points.	
Compound Inequalities "AND" Examples Solve and Graph.	$-9 < 2x - 3 < 7$ $-2 < -2n + 1 \leq 7$
Compound Inequalities "OR" Example Solve and Graph.	$2x + 4 < -6$ OR $3x \geq 21$

Under ideal conditions water will remain a liquid when the temperature is $32^\circ < F^\circ < 212^\circ$. Write the inequality in degrees Celsius. **F =** $\frac{9}{5}\ C + 32$	

1.7	**Solving Absolute Value Equations and Inequalities**
Objectives	1. Solve absolute value equations and inequalities. 2. Use absolute value equations and inequalities to solve real life problems.
Key Terms	Absolute Value
Solving an Absolute Value Equation	The absolute value equation $\|ax + b\| = c$ where c ≠ 0 is equivalent to the compound statement: _____ OR _____ Solve: $\|4x + 2\| = 6$ _____ OR _____ Solve: $\|6x - 3\| = 15$ _____ OR _____
Solving an Absolute Value Inequality Less Than →AND	For **less than** inequalities: $\|ax + b\| < c$ where c > 0, means that ax + b is **between** _____ AND _____. This is equivalent to _____. Solve: $\|2x + 3\| \leq 3$

	Solve: $\|4x - 9\| < 21$
Solving an Absolute Value Inequality Greater Than →OR	For **greater than** inequalities: $\|ax + b\| > c$ where c > 0, means that ax + b is **beyond** _____ AND _____. This is equivalent to _____ OR_____ Solve: $\|2x + 7\| > 3$ _____ OR _____ Solve: $\|3x - 2\| \geq 18$ _____ OR _____
A city ordinance state that pools must be enclosed by a fence that is from 3 feet to 6 feet high. Write an absolute value inequality describing the fences that don't meet this ordinance.	$\|Actual\ Value - Ideal\ Value\| > Tolerance$

*$\|Actual\ Value - Ideal\ Value\| < Tolerance$ if it's between the values.