

Chapter 2 Vocabulary Terms

solving an algebra equation-

Solving an equation means finding the number value of the variable that makes the equation true by performing the “inverse” operation.

Equation $\Rightarrow x + 7 = 10$ Subtract 7 Solution $\Rightarrow x = 3$

Equation $\Rightarrow 8x = 16$ Divide by 8 Solution $\Rightarrow x = 2$

Equation $\Rightarrow \frac{x}{4} = 5$ Multiply by 4 Solution $\Rightarrow x = 20$

Chapter 2 Vocabulary Terms

modeling a problem with an equation-

Writing an algebra equation that is used to solve a word problem. There are three basic steps:

1. **Define** the variables used in the equation
2. **Model** the problem with an equation
3. **Solve** the equation and answer the problem

Chapter 2 Vocabulary Terms

combine like terms

To combine like terms, you replace add or subtract the terms with the same variable. For example, the expression $8x + 3 + 4x - 2 = 12x + 1$.

evaluate

You evaluate an algebraic expression by substituting a given number for a variable then simplify using the order of operations. For example, evaluating $3x + 5$ for $x = 3$ is 14.

Chapter 2 Vocabulary Terms

identity equation

Identity equations have an *infinite* number of solutions. An Identity equation will simplify to a true statement. For example, the equation $2(x + 3) = 2x + 6$ simplifies to $6 = 6$ and is true for all values of x .

Chapter 2 Vocabulary Terms

no solution equation

When an equation simplifies to a *false statement*, the equation has no solution and we use \emptyset to indicate this. For example, the equation $2(x + 3) = 2x + 4$ simplifies to $6 = 4$ which is false and the solution is \emptyset (no solution).

Chapter 2 Vocabulary Terms

simplifying fraction equations

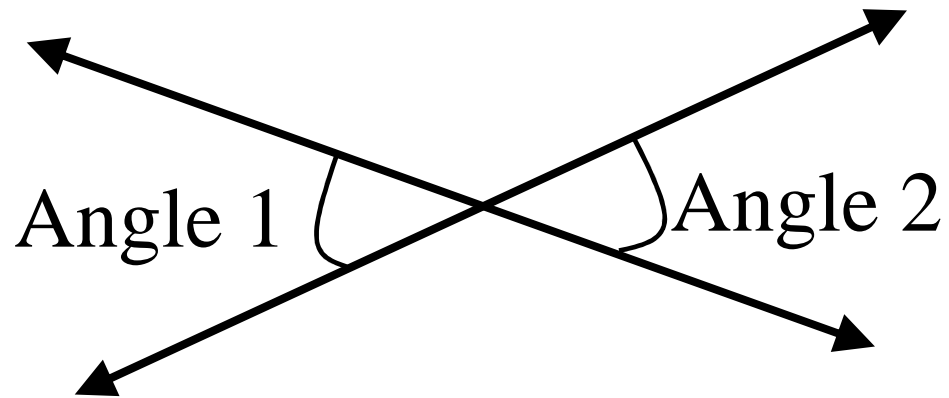
An equation that contains fractions can be simplified into one that has no fractions by multiplying each term by the common denominator and simplifying.

$$\begin{array}{l} \boxed{12} \cdot \boxed{2} \quad \boxed{12} \cdot \boxed{1} \quad \boxed{11} \cdot \boxed{12} \\ \frac{\quad}{3} x + \frac{\quad}{4} x = \frac{\quad}{6} \\ \hline \cancel{\frac{4}{12}} \cdot 2 \quad \cancel{\frac{3}{12}} \cdot 1 \quad \frac{11 \cdot 12}{\cancel{6}}^2 \quad \Rightarrow \quad 8x + 3x = 22 \end{array}$$

Chapter 2 Vocabulary Terms

vertical angles

When two lines intersect, they form two pairs of vertical angles. Vertical angles have the same measure.



The measure of angle 1 is equal to the measure of angle 2

Chapter 2 Vocabulary Terms

mean

A measure of central tendency that is also known as the **average** of a set of data values. It is calculated by finding the sum of the data values and dividing by the number of data values.

median

A measure of central tendency that shows which data value is in the **middle** of the set of data values.

mode

A measure of central tendency that shows which, if any, data value occurs the **most** in a set of data values.

Section 2.1 Checkpoint 1

Solving a one-step addition/subtraction equation

Solve the equation by performing the inverse operation:

$$\begin{array}{r|l} a - 5 & = 13 \\ + 5 & + 5 \\ \hline a & = 18 \end{array}$$

$$\begin{array}{r|l} 21 & = x + 9 \\ - 9 & - 9 \\ \hline 12 & = x \end{array}$$

$$\begin{array}{r|l} n - 4 & = -10 \\ + 4 & + 4 \\ \hline n & = -6 \end{array}$$

Check solution:
Evaluate for $a = 18$

$$18 - 5 = 13 \checkmark$$

Solution is $a = 18$

Check solution:
Evaluate for $x = 12$

$$12 + 9 = 21$$

Solution is $x = 12$

Check solution:
Evaluate for $n = -6$

$$-6 - 4 = -10$$

Solution is $n = -6$

Section 2.1 Checkpoint 2

Solving a one-step multiplication/division equation

Solve the equation by performing the inverse operation:

$$\begin{array}{r|l} 3m & = 12 \\ \hline 3 & 3 \\ \hline m & = 4 \end{array}$$

Check solution:

Evaluate for $m = 4$

$$3(4) = 12$$

Solution is $m = 4$

$$\begin{array}{r|l} (7) \frac{d}{7} & = 5(7) \\ \hline & \\ \hline d & = 35 \end{array}$$

Check solution:

Evaluate for $d = 35$

$$35 \div 7 = 5$$

Solution is $d = 35$

$$\begin{array}{r|l} (-2) - \frac{x}{2} & = 12(-2) \\ \hline & \\ \hline x & = -24 \end{array}$$

Check solution:

Evaluate for $x = -24$

$$-24 \div -2 = 12$$

Solution is $x = -24$

Section 2.1 Checkpoint 3

Solving an addition equation involving fractions

Solve by changing the mixed number to an improper fraction :

$$\begin{array}{r} x + 2\frac{3}{5} = 10\frac{1}{5} \\ x + \frac{13}{5} = \frac{51}{5} \\ -\frac{13}{5} = -\frac{13}{5} \\ \hline x = \frac{38}{5} \end{array}$$

$$x = \frac{38}{5} \text{ or } 7\frac{3}{5}$$

$$\begin{array}{r} 5\frac{3}{4} = x - 8 \\ \frac{23}{4} = x - \frac{32}{4} \\ +\frac{32}{4} = +\frac{32}{4} \\ \hline \frac{55}{4} = x \end{array}$$

$$x = \frac{55}{4} \text{ or } 13\frac{3}{4}$$

$$\begin{array}{r} x - 1\frac{1}{2} = 4\frac{2}{3} \\ x - \frac{3}{2} = \frac{14}{3} \\ x - \frac{9}{6} = \frac{28}{6} \\ +\frac{9}{6} = +\frac{9}{6} \\ \hline x = \frac{37}{6} \end{array}$$

$$x = \frac{37}{6} \text{ or } 6\frac{1}{6}$$

Section 2.1 Checkpoint 4

Solving a multiplication equation with fractions

Solve by multiplying by the reciprocal of the fraction:

$$\begin{array}{r} \frac{2}{3}x = 6 \\ \left(\frac{3}{2}\right)\frac{2}{3}x = 6\left(\frac{3}{2}\right) \\ x = \frac{18}{2} \\ \hline x = 9 \end{array}$$

$$x = 9$$

$$\begin{array}{r} 24 = \frac{3}{4}x \\ \left(\frac{4}{3}\right)24 = \left(\frac{4}{3}\right)\frac{3}{4}x \\ \frac{96}{3} = x \\ \hline 32 = x \end{array}$$

$$x = 32$$

Section 2.2 Checkpoint #5

Solving a two-step equation

Solve each equation and check your solution:

$$\begin{array}{r|l} 3x - 2 & = 10 \\ + 2 & + 2 \\ \hline 3x & 12 \\ \hline 3 & 3 \\ \hline x & = 4 \end{array}$$

Add 2

Divide by 3

Check for $x = 4$

$$3(4) - 2 = 10$$

$$x = 4$$

$$\begin{array}{r|l} -x + 5 & = -9 \\ - 5 & - 5 \\ \hline -x & -14 \\ \hline -1 & -1 \\ \hline x & = 14 \end{array}$$

Subtract 5

Divide by -1

Check for $x = 14$

$$-(14) + 5 = -9$$

$$x = 14$$

Section 2.2 Checkpoint #6

Solving a two-step equation with fractions

Solve each equation and check your solution:

$$\begin{array}{r|l} 6 + \frac{x}{3} & = 11 \\ -6 & -6 \end{array}$$

Subtract 6

$$\begin{array}{r|l} (3)\frac{x}{3} & 5(3) \\ \hline & \end{array}$$

Multiply by 3

$$x = 15$$

Check for $x = 15$

$$6 + \frac{15}{3} = 11 \quad \boxed{x = 15}$$

$$\begin{array}{r|l} 18 & = -\frac{x}{4} - 2 \\ +2 & +2 \end{array}$$

Add 2

$$\begin{array}{r|l} (-4)20 & -\frac{x}{4}(-4) \\ \hline & \end{array}$$

Multiply by -4

$$-80 = x$$

Check for $x = -80$

$$18 = -\frac{(-80)}{4} - 2 \quad \boxed{x = -80}$$

Section 2.2 Checkpoint #7

Modeling and solving number phrases

Write and solve an equation that models the phrase.
Use n to represent the number.

The sum of twice a number and 7 is 23. What is the number?

1. Define the variable

$$\text{Number} = n$$

2. Model problem

$$(2 \times n) + 7 = 23$$

3. Solve equation and
answer problem

$$2n + 7 = 23$$

$$2n = 16$$

The number is 8

$$n = 8$$

Section 2.2 Checkpoint #8

Modeling and solving a problem

You want to buy a bag of popcorn and some sodas with \$14 you have to spend. The bag of popcorn cost \$2.75 and the sodas are \$1.25 each. How many sodas can you buy?

1. Define variable Number of sodas = n

2. Model problem $\$14 = \text{Popcorn} + (\text{Number of sodas} \times 1.25)$

3. Solve equation and answer problem $14 = 2.75 + 1.25n$

$$11.25 = 1.25n$$

9 sodas

$$9 = n$$

Section 2.3 Checkpoint 9

Solving multi-step equations: Combine like terms

Solve each equation and check your answer:

$$\begin{array}{r|l} 4x - 7x + 4 = 16 & \\ -3x + 4 & 16 \\ \hline -4 & -4 \\ \hline -3x & 12 \\ \hline -3 & -3 \\ \hline & x = -4 \end{array}$$

Combine like terms

Subtract 4

Divide by -3

Check for $x = -4$

$$4(-4) - 7(-4) + 4 = 16$$

$$x = -4$$

$$\begin{array}{r|l} 7.6 = 0.3x - 8 + 4.9x & \\ 7.6 = 5.2x - 8 & \\ +8 & +8 \\ \hline 15.6 & 5.2x \\ \hline 5.2 & 5.2 \\ \hline & 3 = x \end{array}$$

Combine like terms

Add 8

Divide by 5.2

Check for $x = 3$

$$7.6 = 0.3(3) - 8 + 4.9(3)$$

$$x = 3$$

Section 2.3 Checkpoint 10

Solving multi-step equations: Distributive property

Solve each equation and check your answer:

$$\begin{array}{r|l} 5(2x - 3) = 55 & \\ \hline 10x - 15 & 55 \\ + 15 & + 15 \\ \hline 10x & 70 \\ \hline 10 & 10 \\ \hline x = 7 & \end{array}$$

Distribute 5

Add 15

Divide by 10

Check for $x = 7$

$$5(2 \cdot 7 - 3) = 55$$

$$x = 7$$

$$\begin{array}{r|l} 7x - (4x + 5) = 16 & \\ \hline 7x - 4x - 5 & 16 \\ 3x - 5 & 16 \\ + 5 & + 5 \\ \hline 3x & 21 \\ \hline 3 & 3 \\ \hline x = 7 & \end{array}$$

Distribute -1

Combine like terms

Add 5

Divide by 3

Check for $x = 7$

$$7(7) - (4 \cdot 7 + 5) = 16$$

$$x = 7$$

Section 2.3 Checkpoint 11

Solving with Fractions: Distributive property

Solve each equation and check your answer:

$$\frac{2}{3}(6x + 12) = -20$$

			Distribute 2/3
4x + 8		-20	
-8		-8	Subtract 8
<hr/>		<hr/>	
4x		-28	Divide by 4

Check for $x = -7$

$$x = -7$$

$$\frac{2}{3}(6(-7) + 12) = -20$$

$$\frac{1}{2}(5x - 4) = 28$$

			Multiply by 2
5x - 4		56	
+4		+4	Add 4
<hr/>		<hr/>	
5x		60	Divide by 5

$$x = 12$$

Check for $x = 12$

$$x = 12$$

$$\frac{1}{2}(5 \cdot 12 - 4) = 28$$

Section 2.4 Checkpoint 12

Solving equations with variables on both sides

Solve each equation and check your answer.

Begin by getting all variables on one side of equal sign.

$$\begin{array}{r|l} 6x - 2 & = x + 13 \\ -x & -x \\ \hline 5x - 2 & 13 \\ +2 & +2 \\ \hline 5x & 15 \\ \hline \frac{5x}{5} & \frac{15}{5} \\ \hline x & = 3 \end{array}$$

Subtract x

Add 2

Divide by 5

Check for $x = 3$

$$6(3) - 2 = (3) + 13$$

$$x = 3$$

$$\begin{array}{r|l} 2n - 5 & = 8n + 7 \\ -2n & -2n \\ \hline -5 & 6n + 7 \\ -7 & -7 \\ \hline -12 & 6n \\ \hline \frac{-12}{6} & \frac{6n}{6} \\ \hline -2 & = n \end{array}$$

Subtract $2n$

Subtract 7

Divide by 6

Check for $n = -2$

$$2(-2) - 5 = 8(-2) + 7$$

$$n = -2$$

Section 2.4 Checkpoint 13

Variables on both sides and combining like terms

Solve each equation and check your answer.

Begin combining like terms.

$$4x - 16 = 6x + 2 - 5x \quad \boxed{\text{Combine like terms}}$$

$$\begin{array}{r|l} 4x - 16 & = & x + 2 \\ -x & & -x \end{array} \quad \boxed{\text{Subtract } x}$$

$$\begin{array}{r|l} 3x - 16 & & 2 \\ +16 & & +16 \end{array} \quad \boxed{\text{Add 16}}$$

$$\begin{array}{r|l} \frac{3x}{3} & & \frac{18}{3} \end{array} \quad \boxed{\text{Divide by 3}}$$

$$x = 6$$

$\boxed{\text{Check for } x = 6}$

$$4(6) - 16 = 6(6) + 2 - 5(6)$$

$$\boxed{x = 6}$$

Section 2.4 Checkpoint 14

Variables on both sides: Zero solution

Solve the equation and check your answer:

Begin distributing and simplifying.

$$10n - 8 = 2(3n - 4)$$

Simplify by distributing

$$10n - 8 = 6n - 8$$

Subtract $6n$

$$\begin{array}{r} 10n - 8 \\ -6n \\ \hline 4n - 8 \end{array} = \begin{array}{r} 6n - 8 \\ -6n \\ \hline -8 \end{array}$$

Add 8

$$\begin{array}{r} 4n - 8 \\ +8 \\ \hline 4n \end{array} = \begin{array}{r} -8 \\ +8 \\ \hline 0 \end{array}$$

Divide by 4

$$\frac{4n}{4} = \frac{0}{4}$$

$$n = 0$$

Check for $n = 0$

$$10(0) - 8 = 2(3(0) - 4)$$

$$n = 0$$

Section 2.4 Checkpoint 15

Variables on both sides: identity/no solution

Solve the equation and check your answer:

$$20n + 5 - 2n = 3(6n + 2)$$

$$18n + 5$$

$$18n + 6$$

$$-18n$$

$$-18n$$

$$5$$

$$6$$

$$5$$

$$\neq$$

$$6$$

$$\emptyset$$

Simplify by Combining like terms and distribute

Subtract 18n

The n's cancel!

5 = 6 is a false statement!

No Solution!

Section 2.4 Checkpoint 16

Variables on both sides: identity/no solution

Solve the equation and check your answer:

$$-8x + 14 = -2(4x - 7)$$

$$\begin{array}{r|l} -8x + 14 & -8x + 14 \\ +8x & +8x \\ \hline 14 & 14 \\ \hline 14 = & 14 \end{array}$$

Simplify by Distributive property

Add $8x$

The x 's cancel!

Identity

$14 = 14$ is a true statement!

True for all numbers!

Section 2.4 Checkpoint 17

Simplifying and solving fraction equations

Simplify and solve the fraction equation:

$$\frac{12 \cdot 2}{3}x - \frac{12 \cdot 3}{4} = \frac{3 \cdot 12}{4}x$$

Simplify by multiplying each term by the common denominator

$$\frac{4 \cdot 2x}{1} - \frac{3 \cdot 3}{1} = \frac{3 \cdot 3x}{1}$$

Divide to eliminate the fractions

$$\begin{array}{r} 8x - 9 \\ -8x \\ \hline -9 \end{array} = \begin{array}{r} 9x \\ -8x \\ \hline x \end{array}$$

Subtract $8x$

Check for $x = -9$

$$\frac{2}{3}(-9) - \frac{3}{4} = \frac{3}{4}(-9)$$

$$x = -9$$

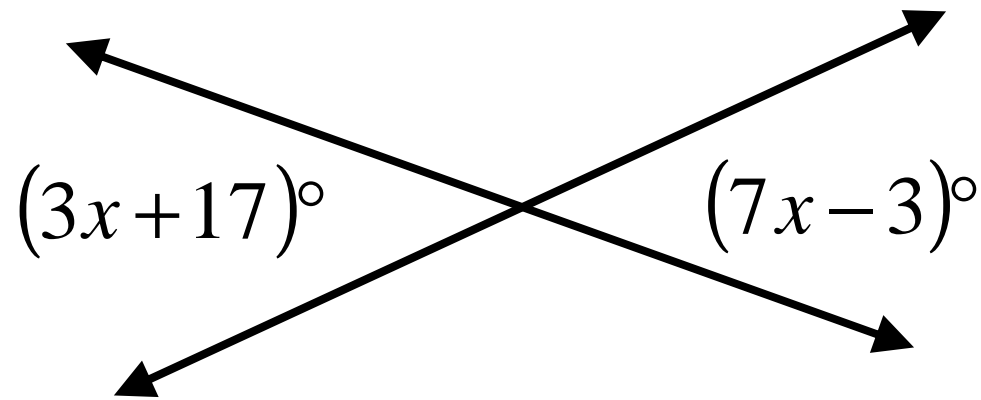
Section 2.4 Checkpoint 18

Equations with vertical angles

Find the value of x :

$$\begin{array}{r|l} 3x + 17 & = 7x - 3 \\ -3x & -3x \\ \hline 17 & 4x - 3 \\ +3 & +3 \\ \hline 20 & 4x \\ \hline 4 & 4 \end{array}$$

$$5 = x$$



$$x = 5$$

Section 2.5 Checkpoint 19

Modeling and Solving “Rectangle” Problems

Write and solve an equation for the problem:

The length of a rectangle is 6 inches more than its width. The perimeter of the rectangle is 24 inches.

What is the length and width of the rectangle?

Define variables

l = length

w = width

Model problem

$$P = 2l + 2w$$

$$l = w + 6$$

$$24 = 2l + 2w$$

$$24 = 2(w + 6) + 2w$$

Solve equation

$$24 = 2(w + 6) + 2w$$

$$w = 3$$

Answer problem

Length = 9 in.

Width = 3 in.

Section 2.5 Checkpoint 20

Modeling and Solving “Consecutive Integer” Problems

Write and solve an equation for the problem:

The sum of three consecutive integers is 147. Find each of the integers.

Define variables

n = first integer

$n + 1$ = second
integer

$n + 2$ = third
integer

Model problem

$$n + (n + 1) + (n + 2) = 147$$

Solve equation

$$3n + 3 = 147$$

$$n = 48$$

Answer problem

$$n = 48$$

$$n + 1 = 49$$

$$n + 2 = 50$$

**The three
integers are
48, 49, 50**

Section 2.6 Checkpoint 21

Solving Formulas

Solve each formula in terms of the given variable:

$$\frac{D}{t} = rt; \boxed{r}$$

Means solve for r or get r by itself

$$\boxed{r = \frac{D}{t}}$$

$$\frac{A}{P} = P(r + t); \boxed{t}$$

Means solve for t

$$\boxed{t = \frac{A}{P} - r}$$

$$\Rightarrow \frac{A}{P} - r = t$$

Section 2.6 Checkpoint 22

Solving an equation for another variable

Solve each equation in terms of the given variable:

$$\begin{array}{r|l} \boxed{y} - 3x = 12 & \text{Solve for } y \\ + 3x & + 3x \\ \hline y & 3x + 12 \end{array}$$

$$\boxed{y = 3x + 12}$$

$$\begin{array}{r|l} 5a - 3\boxed{b} = c & \text{Solve for } b \\ - 5a & - 5a \\ \hline - 3b & - 5a + c \\ \hline - 3 & - 3 \\ \hline b = & \frac{5a - c}{3} \end{array}$$

$$\boxed{b = \frac{5a - c}{3}}$$

Section 7.7 Checkpoint 23

Finding measures of central tendency

Find the mean, median, and mode:

Time spent on the internet, minutes per day

75, 38, 43, 120, 65, 48, 52

mean 63

$$\frac{75 + 38 + 43 + 120 + 65 + 48 + 52}{7}$$

median 52

38, 43, 48, 52, 65, 75, 120

mode none

38, 43, 48, 52, 65, 75, 120

Scores on a 10-point quiz

10, 4, 7, 9, 8, 5, 6, 9

mean 7.25

$$\frac{10 + 4 + 7 + 9 + 8 + 5 + 6 + 9}{8}$$

median 7.5

$$4, 5, 6, \boxed{7, 8}, 9, 9, 10 \Rightarrow \frac{7 + 8}{2} = 7.5$$

mode 9

4, 5, 6, 7, 8, 9, 9, 10

Section 7.7 Checkpoint 24

Solving a “mean” equation

Write and solve an equation to find the value of x :

99, 86, 76, 95, x ; mean 91

Write equation

$$\frac{99 + 86 + 76 + 95 + x}{5} = 91$$

Solve

$x = 99$

$$\begin{array}{r}
 5 \left(\frac{99 + 86 + 76 + 95 + x}{5} \right) \neq 91 \cdot 5 \\
 \hline
 99 + 86 + 76 + 95 + x \neq 455 \\
 356 + x \neq 455 \\
 \underline{-356} \qquad \underline{-356} \\
 x \neq 99
 \end{array}$$

Three history exam grades are 80, 93, and 91. What do you need to score on the fourth exam to get an average of 90? you need a 96

Write equation and solve

$$\begin{array}{r}
 \frac{80 + 93 + 91 + x}{4} \neq 90 \\
 4 \left(\frac{80 + 93 + 91 + x}{4} \right) \neq 90 \cdot 4 \\
 \hline
 80 + 93 + 91 + x \neq 360 \\
 264 + x \neq 360 \\
 \underline{-264} \qquad \underline{-264} \\
 x \neq 96
 \end{array}$$

Assignment Sheet

Wednesday 9/16

Algebra 1A	Name _____
Chapter 2 Solving Equations	Portfolio Assignment List

1	9/14 Homework WB p. 20 #27-50 (show all work)
2	9/15 Classwork TB p. 80 #85, 86, 90, 95-98
3	9/15 Homework WB p. 21 #1-20
4	9/16 Classwork TB p. 92 #39-50
5	9/16 Homework WB p. 23 #13-36

Assignment Sheet

Monday 9/21

Algebra 1A Chapter 2 Solving Equations	Name _____ Portfolio Assignment List
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6	9/17 Classwork TB p. 101 #64-79
7	9/17 Classwork WS (Worksheet) 2.3 #1-4
8	9/17 Classwork WB p. 24 #46-50
9	9/17 Homework WB p. 23 #1-12
10	9/21 Classwork TB p. 99 #28-37
11	9/21 Homework WB p. 25 #1-21

Assignment Sheet

Thursday 9/24

Algebra 1A Chapter 2 Solving Equations	Name _____ Portfolio Assignment List
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12	9/22 Homework WB p. 25 #22-33
13	9/23 Classwork TB p. 110 #40-45
14	9/23 Classwork TB p. 107 #1-9 all
15	9/24 Classwork TB p. 115 #51-52
16	9/24 Classwork TB p. 113 #9-24
17	9/24 Homework WB p. 29 #1-12