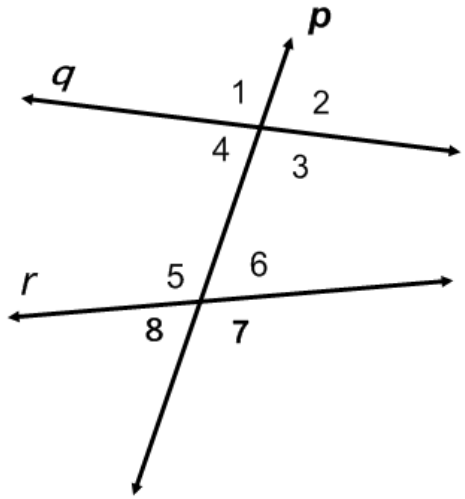
Name _____ Period ___ Date _____

Two Lines and a Transversal

(Warm Up)

Directions: Correctly place an angle number in the correct box. Angle numbers may repeat.

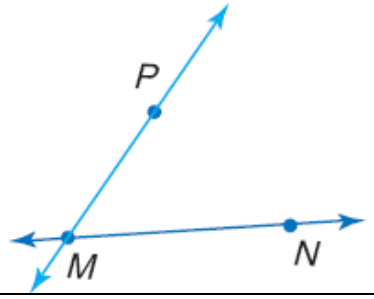
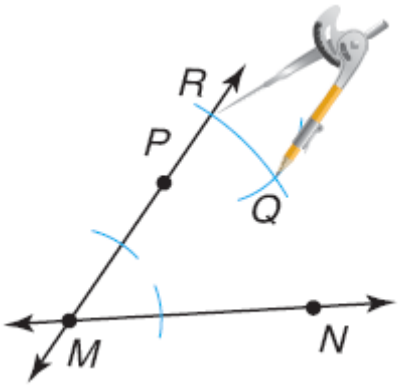
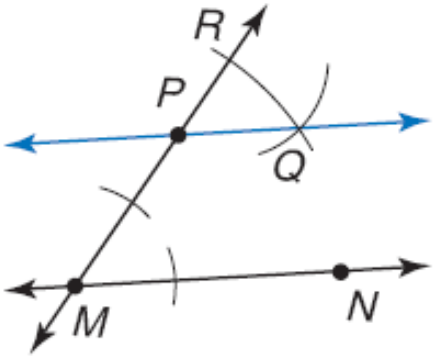
Name	Angles	Transversal *p* intersects lines *q* and *r*
Exterior Angles		
Interior Angles		
Consecutive Interior Angles		
Alternate Exterior Angles		
Alternate Interior Angles		
Corresponding Angles		

Name _____ Period ___ Date _____

Parallel Lines By Copying an Angle

(Guided Practice Construction)

Directions : Read the column on the left and use your geometric tools to construct the figure on the right in your portfolio.
Complete the conjecture at the bottom of the page.

1. Use a straight edge to draw $\overleftrightarrow{MN}$. Draw point *P* that is not on $\overleftrightarrow{MN}$. Draw $\overleftrightarrow{PM}$	
2. Copy $\angle PMN$ (Please refer to your notebook on how to copy an angle.) so that P is the vertex of the new angle. Label the intersection points Q and R.	
3. Draw $\overleftrightarrow{PQ}$ $\angle PMN$ is congruent to $\angle RPQ$ by construction.	

Conjecture: If corresponding angles are congruent when two lines are cut by a transversal, then the lines are _____.

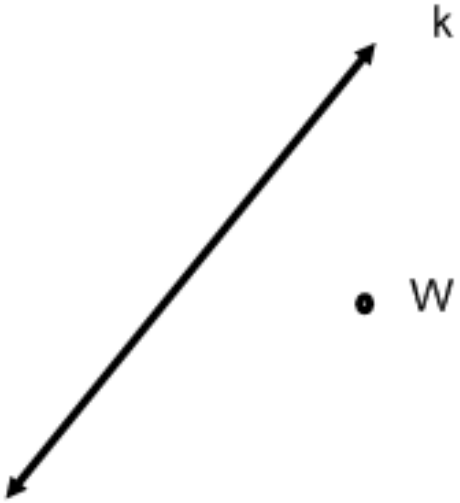
Name ___ _____ Period ___ Date _____

Parallel Lines by Copying Angles

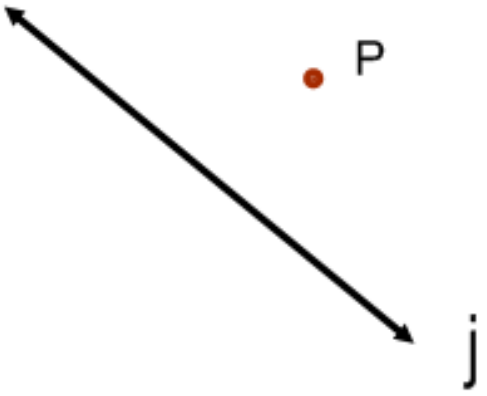
(Independent Practice)

Directions: Using only a compass and straight edge complete the following constructions.

1. Construct a line parallel to line k that passes through point W.

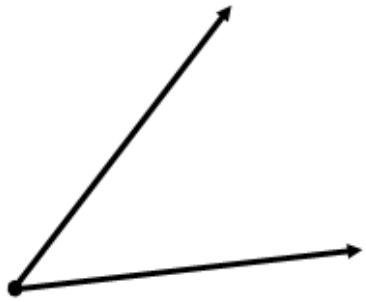


2. Construct a line parallel to line j that passes through point P.

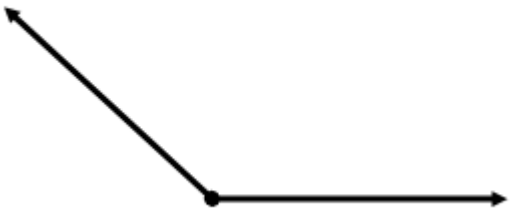


Name ___ _____ Period ___ Date _____

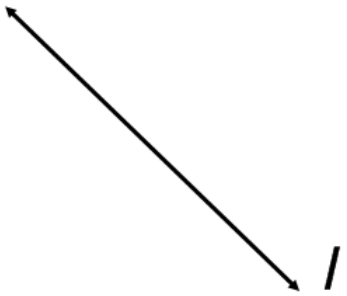
3. Construct two parallel lines and a traversal such that the corresponding angles are congruent to the angle below:



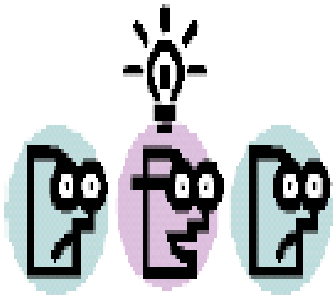
4. Construct two parallel lines and a traversal such that one pair of alternate interior angles are congruent to the angle below:



5. Construct a line that contains point Q parallel to line *l* such that point Q is exactly apart.

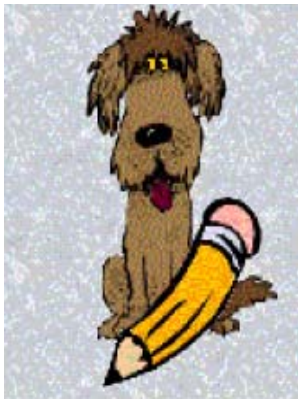


Name: _____ Period: ____ Date:_____

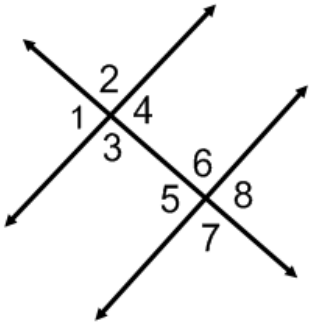


Angle Identity

(Warm Up)



Line *m* is parallel to line *n* and line *t* is the transversal. Answer the following questions using the diagram to the right.



a) Name all pairs of alternate interior angles.

b) Name all pairs of corresponding angles.

c) Name all pairs of alternate exterior angles.

d) Name all linear pairs angles.

e) Name all vertical angles.

f) Name all consecutive interior angles.

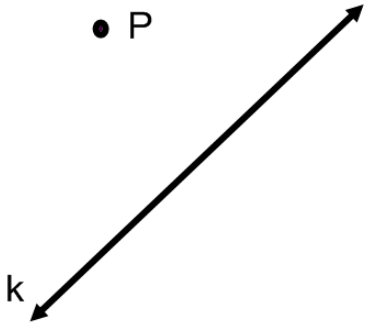
Name _____ Period ___ Date _____

Parallel Line and a Point

(Independent Practice)

Directions: Complete the constructions below using only a straightedge and a compass.

1. Construct a line that is parallel to line k and passes through point P.



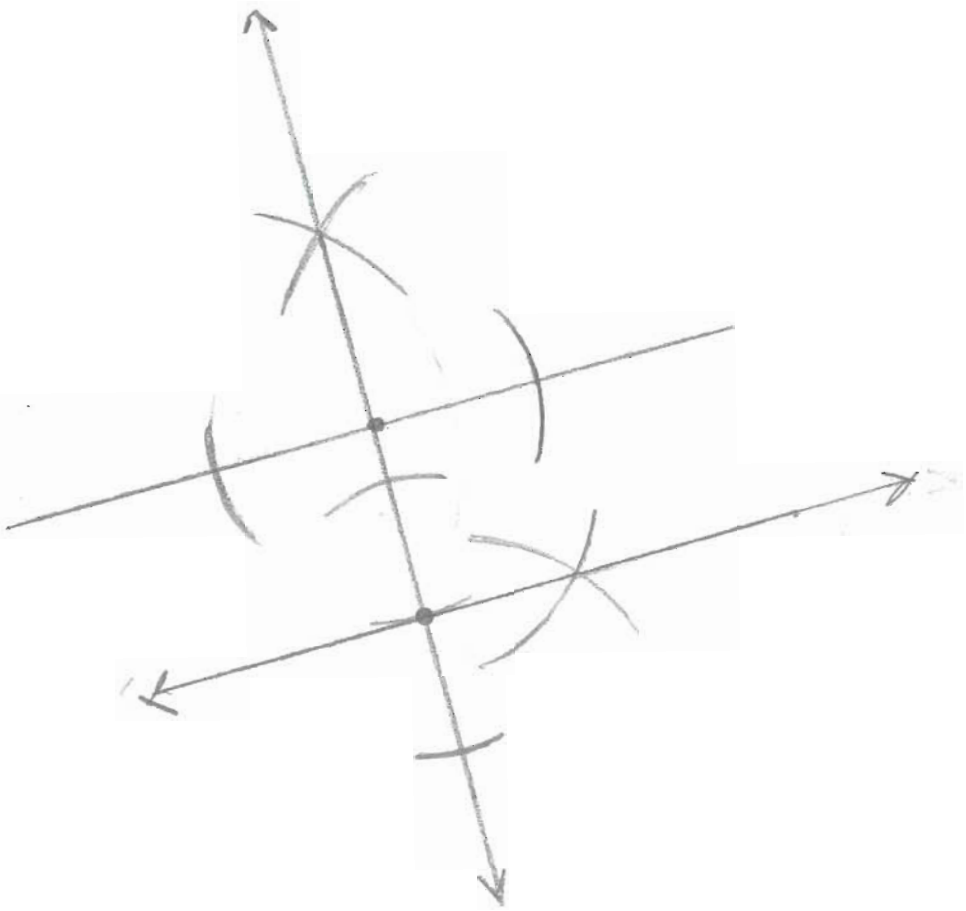
2. Construct a line that is parallel to line *n* and passes through point R.

Name _____ Period ___ Date _____

3. Construct and label two parallel lines and a traversal such that the distance between the parallel lines is exactly 
.

Name _____KEY_____ Period ___ Date _____

3.



Name _____ Period ___ Date _____

City Project

(High Level Task)

Overview: City planners and designers must be able to accurately draw parallel and perpendicular lines to create a city map.

Objective: Draw a city map using only a compass and straightedge that meets conditions below.

Materials: Poster or blank paper, colored pencils, eraser, compass and straightedge.

Directions: Assume no two buildings can occupy the same space. Make your constructions lines light so that they can be easily be erased. Draw a city with the following conditions:

1. Use a straight edge to draw and label a street across your paper.
2. Draw and label a street that intersects the previous street drawn.
3. Construct and label three streets that are parallel to one of the streets you just drew.
4. Construct at least two transversal streets that are perpendicular to the parallel streets.
5. Sketch a house and a school on a pair of consecutive interior angles.
6. Sketch a bank and a post office on a pair of corresponding angles.
7. Sketch a grocery store and an electronic store on a pair of alternate interior angles.
8. Sketch a movie theater and a pet store on a pair of alternate exterior angles.
9. Sketch a water tower halfway between the bank and the post office.
10. Sketch a park exactly halfway between the grocery store and the school.
11. Sketch traffic lights on at least four intersections.
12. Sketch a hospital exactly this length away from the electronic store.

Names: _____ Task: _____

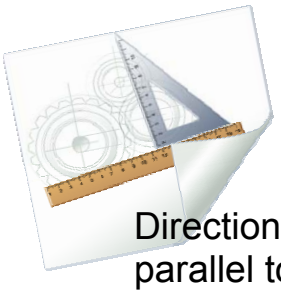
Scores: Student (__/16 = __%) Teacher (__/16 = __%)

Assessing the High Level Task

(Rubric)

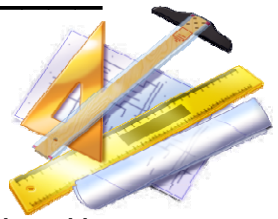
	4	3	2	1	Points
Mathematical Language ● _____ ● _____ ● _____ ● _____	Appropriate language **ALWAYS** selected and used properly	Appropriate language selected and used properly **MOST OF THE TIME**	Appropriate language **SOMETIMES** selected and used properly	Appropriate language **SELDOM OR NEVER** selected and used properly	Student Score ☐ Teacher Score ☐
Problem Solving Strategies ● Used constructions ● Construction lines are neatly erased. ● Followed directions ● Used color ● Labeled diagrams	Appropriate strategy or strategies **ALWAYS** selected and used properly	Appropriate strategy or strategies selected and used properly **MOST OF THE TIME**	Appropriate strategy or strategies **SOMETIMES** selected and used properly	Appropriate strategy or strategies **SELDOM OR NEVER** selected and used properly	Student Score ☐ Teacher Score ☐
Mathematical Reasoning ● Used logical reasoning ● Utilized sound algebraic and/or mathematical steps and procedures	Logical reasoning **ALWAYS** used to obtain reasonable and correct solutions	Logical reasoning used to obtain reasonable and correct solutions **MOST OF THE TIME**	Logical reasoning **SOMETIMES** used to obtain reasonable and correct solutions	Logical reasoning **SELDOM OR NEVER** used to obtain reasonable and correct solutions	Student Score ☐ Teacher Score ☐
Communication ● Discussed with group ● Presented to class ● Wrote neatly and legibly ● Easily understood by peers	Ideas **ALWAYS** communi-cated clearly and effectively	Ideas communi-cated clearly and effectively **MOST OF THE TIME**	Ideas **SOMETIMES** communi-cated clearly and effectively	Ideas **SELDOM OR NEVER** communi-cated clearly and effectively	Student Score ☐ Teacher Score ☐

Name _____Period ___ Date _____



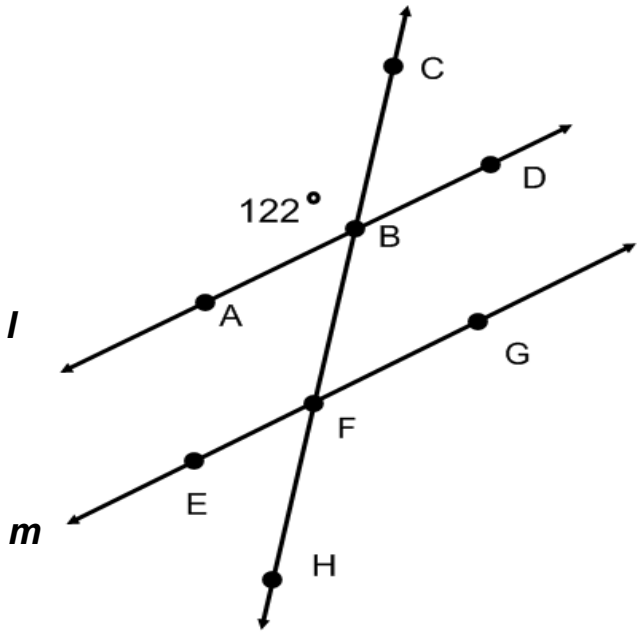
Parallel and Transversals

(Homework)



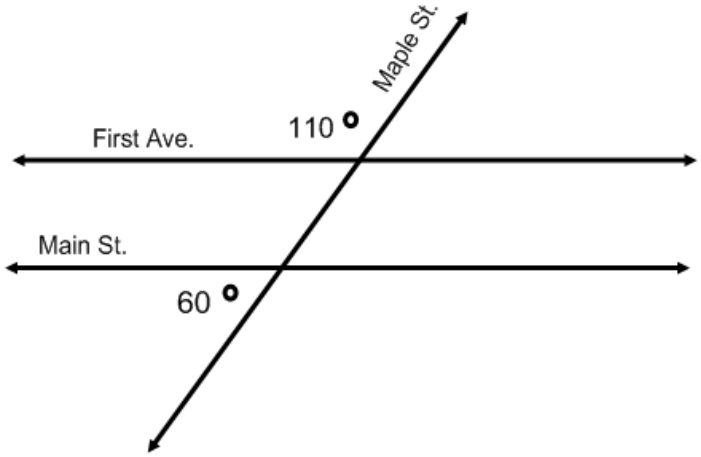
Directions: Use the figure below to answer questions 1 – 5. Line *l* is parallel to line *m*.

1. $m\angle EFB =$
2. $m\angle BFG =$
3. $m\angle ABF =$
4. $m\angle CBD =$
5. $m\angle HFG =$



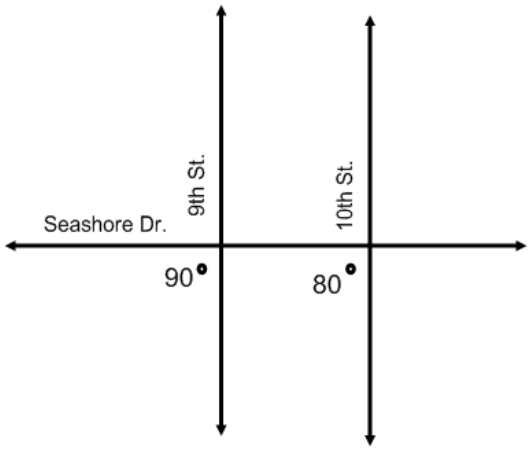
Directions: Use your conjectures about parallel lines and analyze each figure.

6. First Ave. and Main St. are parallel lines. Explain what is wrong with this picture?



Name _____Period ___ Date _____

7. 9^{th} St. and 10^{th} St. are parallel lines. Explain what is wrong with this picture?

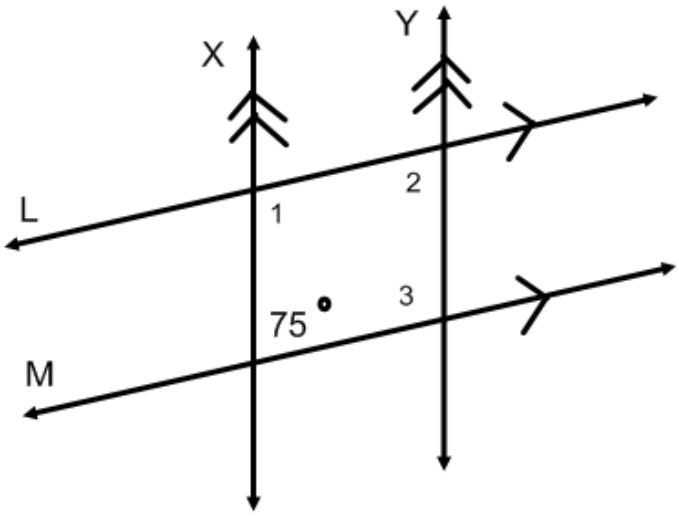


Directions: Use the figure below. Lines X and Y are parallel. Lines L and M are parallel.

8. $m\angle 1 =$

9. $m\angle 2 =$

10. $m\angle 3 =$



Name _____ Period_____ Date_

What's My Measure
(Warm-Up)

If line *A* and *B* are parallel, find the measures of the numbered angles in the figures below.

Figure 1

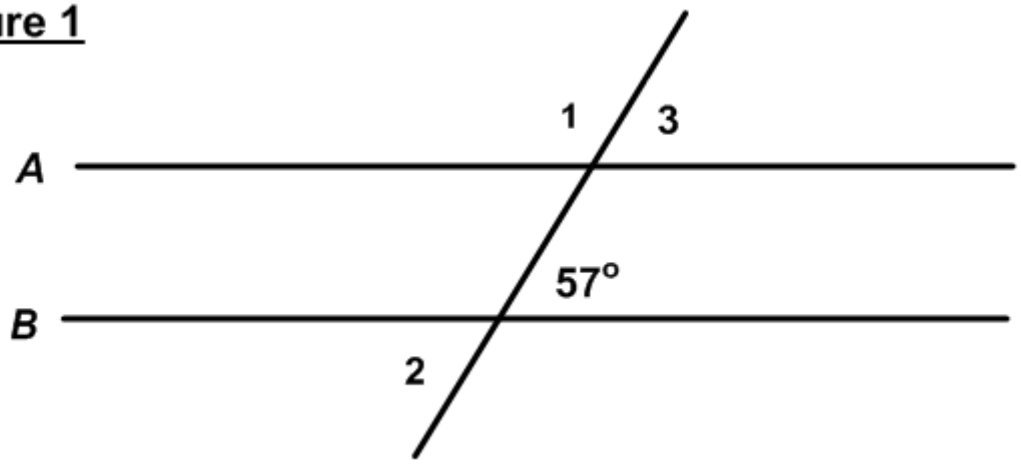
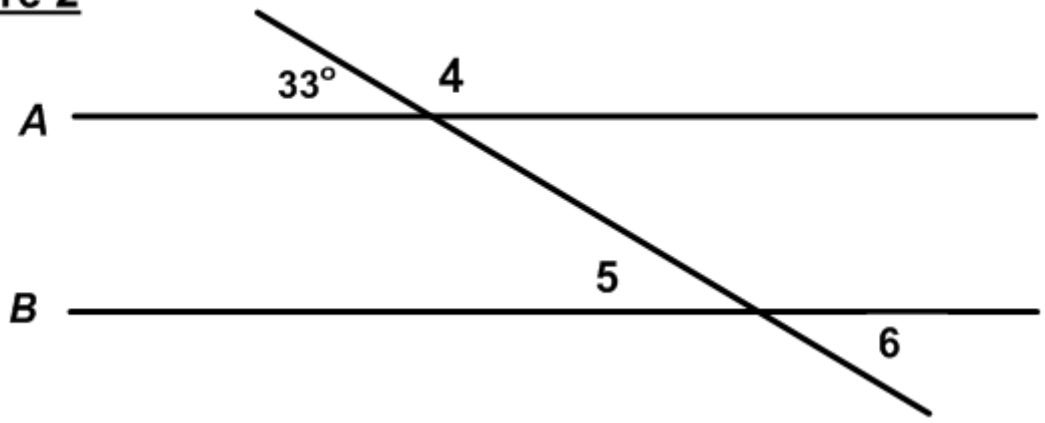
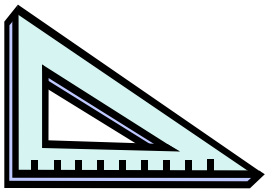


Figure 2



Name_____ Period _____ Date_____



Nspiring Parallels

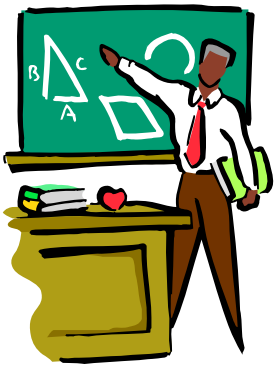
(Guided Practice)

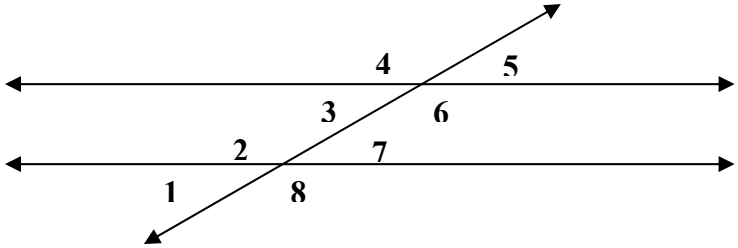
- Draw a line in the box below using a straight edge and label points A and B.
- Create a line parallel to the first line using a straight edge and compass.
- Draw a transversal using a straight edge and label all the points the same as the teacher.
- Use a protractor to measure angle FGD.
- Use a protractor to measure angle GHB and form a conjecture about what you observe. Make sure you use the correct name for the angle pair.
- Measure the rest of the angles on your paper and record the answers.
- Form conjectures for **alternate interior**, **alternate exterior and consecutive interior angles.**

Name_____ Per.____ Date_____

Transversal of Parallel Lines

(Independent Practice)





Using the diagram of parallel lines cut by a transversal, write angle pairs on the table below in the applicable column (congruent or supplementary), then write the special angle names.

∠1 & ∠3, ∠6 & ∠7, ∠4 & ∠8, ∠7 & ∠8,

∠5 & ∠7, ∠2 & ∠3, ∠2 & ∠6, ∠1 & ∠7,

∠3 & ∠7, ∠6 & ∠8, ∠1 & ∠5, ∠3 & ∠5

Congruent	Supplementary	Name of special angles

Name_____ Period _____ Date_____

Lines and Angles

(Homework)

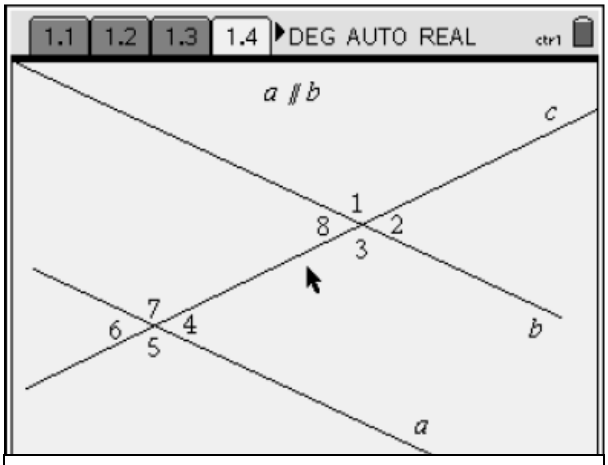
We have learned that when two lines are cut by a transversal, special pairs of angles are formed. Practice identifying these special pairs of angles and look for any relationships among the pairs of angles formed.

1. According to the diagram, lines *a* and *b* are parallel and cut by transversal line *c*.

a. Identify all pairs of corresponding angles.

b. Identify all pairs of alternate interior angles.

c. Identify all pairs of alternate exterior angles.

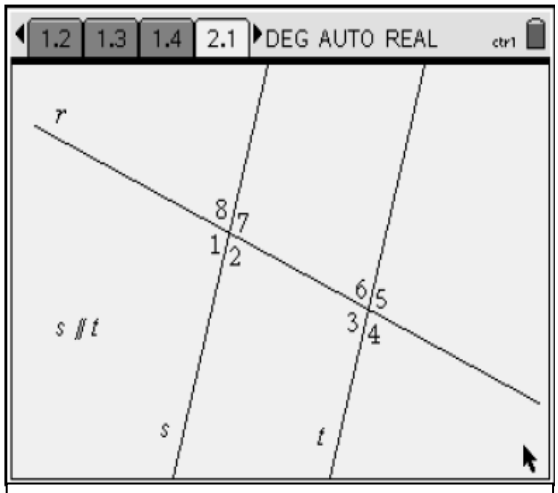


Screen shot of TI Nspire Calculator

d. Identify all pairs of consecutive interior angles.

Name_____ Period _____ Date_____

2. According to the diagram, lines *s* and *t* are parallel and cut by transversal line *r*.



Screen shot of TI Nspire Calculator

a. Identify all pairs of corresponding angles.

b. Identify all pairs of alternate interior angles.

c. Identify all pairs of alternate exterior angles.

d. Identify all pairs of consecutive interior angles.

3. Considering both problems, what have you observed?

4. Can we make some generalizations?

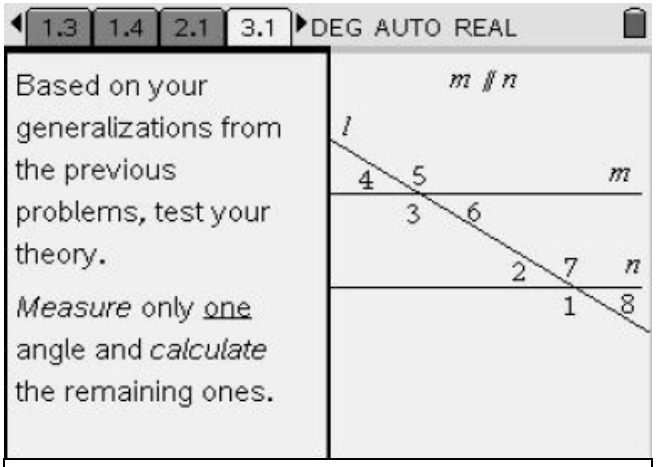
Therefore a conjecture can be:

5. If two parallel lines are cut by a transversal, then: corresponding angles are _____, alternate interior angles are _____, alternate exterior angles are _____, consecutive interior angles are _____.

Name_____ Period _____ Date_____

Extension: TI Nspiring Calculator

Now use your handheld calculations to create the diagram on the right. Measure any one angle with the commands on the calculator.



Verify your calculations on your handheld.

6. Choose any one angle to measure.
m∠___ = ____

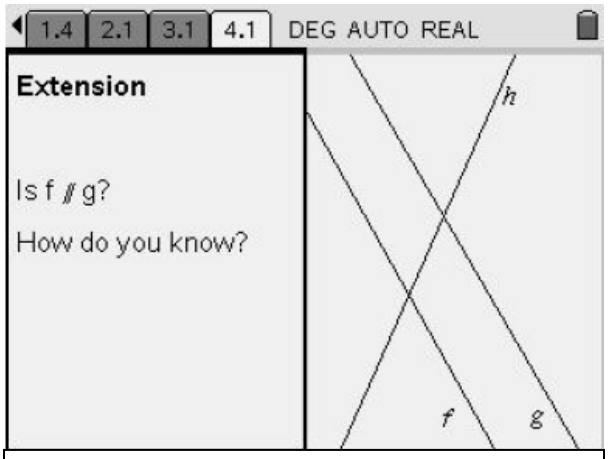
Based on that one measurement, calculate the remaining seven measures.

m∠1 = ____ m∠5 = ____

m∠2 = ____ m∠6 = ____

m∠3 = ____ m∠7 = ____

m∠4 = ____ m∠8 = ____



Create lines cut by a transversal on TI Nspire. Use the menu tools to determine if the lines are parallel.

7. Are lines f and g parallel? _____

How do you know?

Be specific.

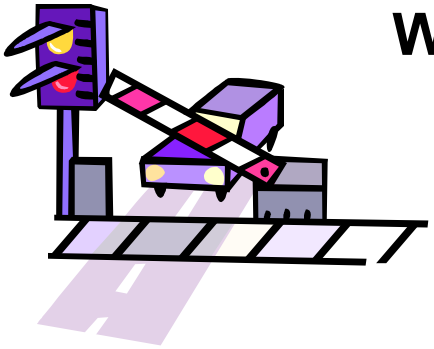
_____

_____

_____

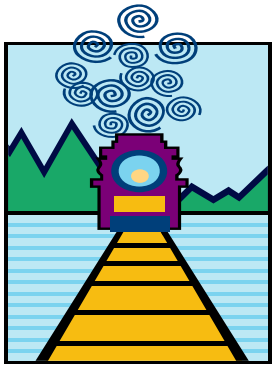
_____.

Name_____ Period _____ Date_____



What Measure Does it Meet

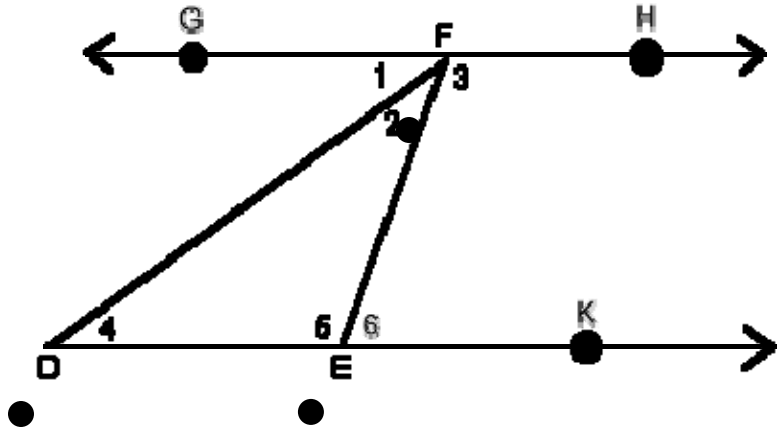
(Warm Up)



Given: $\overleftrightarrow{GH}$ is parallel to $\overrightarrow{DK}$

$\angle 6 = 75^{o}$

$\angle 2 = 30^{o}$



Find the measure of the other angles.

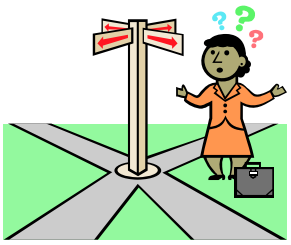
m $\angle$ GFD =

m $\angle$ HFE =

m $\angle$ FDE =

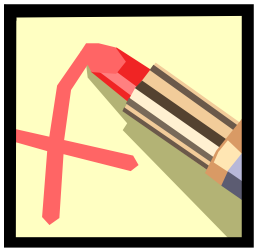
m $\angle$ DEF =

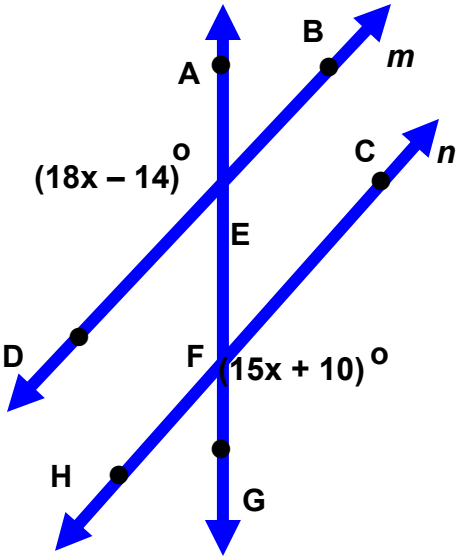
Name _____ Period ___ Date _____



Angle Make-Up

(Guided Practice)





Find x and the measure of ∠AED so that m ∥ n.

1. **What is the special angle relationship between ∠ AED and ∠ CFG?**
   _____.

Solve for x.

m ∠ AED = m ∠_____

_____ = _____

_____ = _____

_____ = _____

_____ = _____

_____ = _____

X = _____

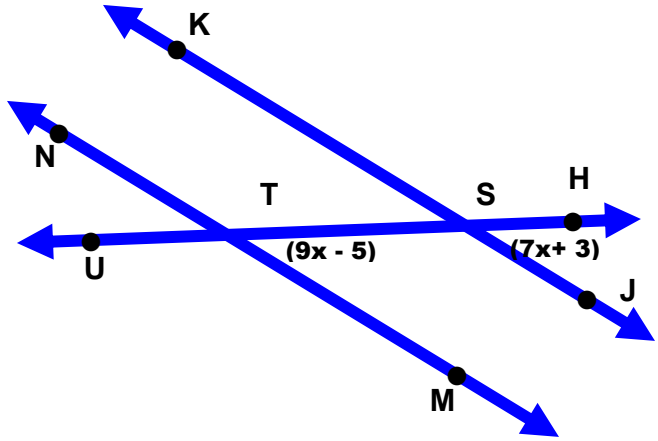
Name _____ Period ___ Date _____

3. Find the m∠ AED using the value of x.

m ∠ AED = 18x - 14

= _____
= _____
= _____

m ∠AED = _____



4. Find x so that JK ∥ MN

m ∠ HSJ = m∠ STM

Solve for x.

What is the special angle relationship between ∠HSJ and ∠STM?

_____

7x + 3 **=** **9x - 5**

_____ **=** _____

_____ **=** _____

_____ **=** _____

_____ **=** _____

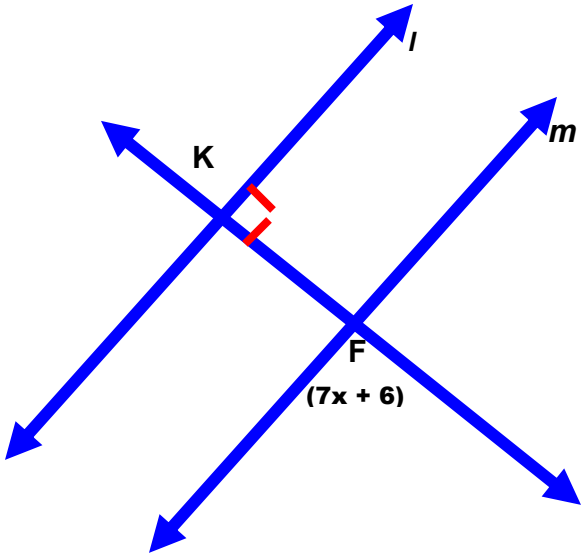
_____ **=** _____

What is the measure of ∠HSJ? _____

What is the measure of ∠KSH? _____

Name _____ Period ___ Date _____

5. Find x and the measure of ∠F so that *l* ∥ *m*.



What is the relationship between ∠F and ∠K.

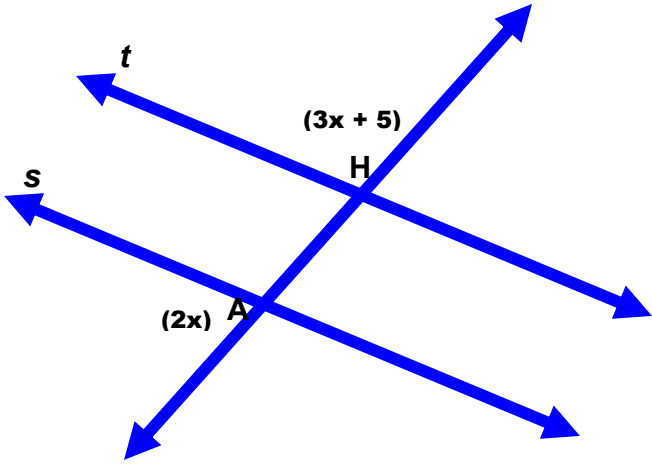
_____

Solve for x.

X = _____.

The measure of ∠F is _____.

6. Find x so that *s* ∥ *t*.



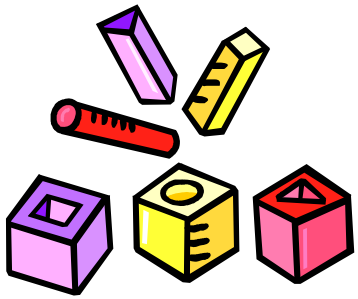
What is the relationship between ∠A and ∠H.

Solve for x.

X = _____.

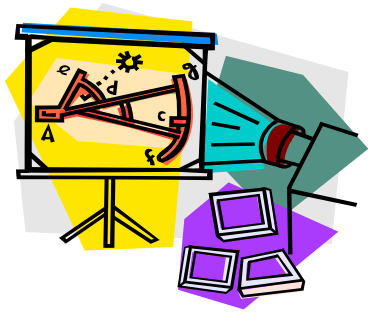
The measure of ∠A is _____.
The measure of ∠H is _____.

Name_____Period _____ Date _____

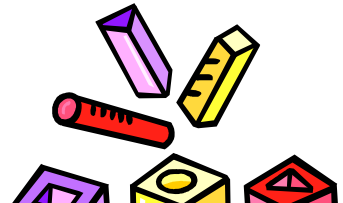


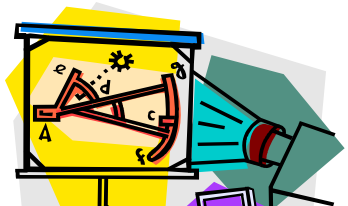
Mix and Match

(Independent Practice)



If there are <u>corresponding angles,</u> then $m\angle 1 = (9X - 4)^\circ$ and $m\angle 2 = (31X + 16)^\circ$. Find the value of X and the measure of the angles.	**If there are <u>vertical angles,</u> then $m\angle 1 = (3x - 5)^\circ$ and $m\angle 2 = (2x + 35)^\circ$. Find the value of x and the measure of the angles.**	**If there are <u>alternate exterior angles,</u> then $m\angle 1 = 57^\circ$ and $m\angle 2 = (\frac{1}{2}x + 35)^\circ$. Find the value of x and the measure of the angles.**
If there are <u>consecutive interior angles</u>, then $m\angle 1 = 45^\circ$ and $m\angle 2 = (25x + 10)^\circ$. Find the value of x and the measure of the angles.	**If there are <u>alternate interior</u> angles, then $m\angle 1 = 92^\circ$ and $m\angle 2 = (4x - 8)^\circ$. Find the value of x and the measure of the angles.**	**If there are <u>linear pairs,</u> then $m\angle 1 = (2x + 15)^\circ$ and $m\angle 2 = 135^\circ$. Find the value of x and the measure of the angles.**



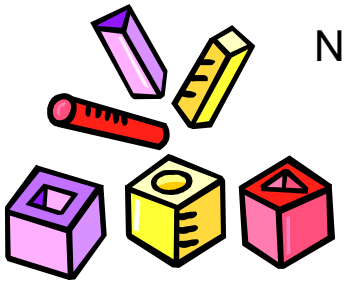


Name_____Period _____ Date _____

Mix and Match Answer Template

(Independent Practice)

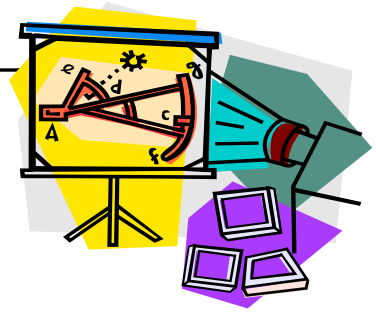
Parallel lines diagrams	Names of the special angles	Value of x and the angles' measurements



Name_____Period _____ Date _____

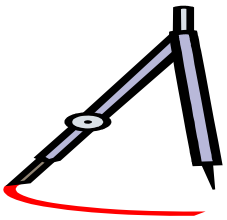
Mix and Match Answer Template

(Independent Practice)



Parallel lines diagrams	Names of the special angles	Value of x and the angles' measurements

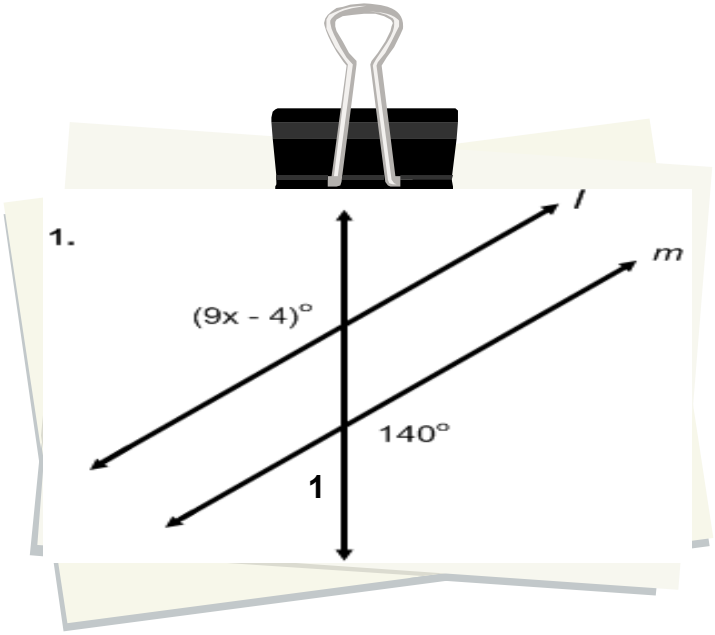
Name_____ Period _____ Date _____



Proven Measures

(Homework)

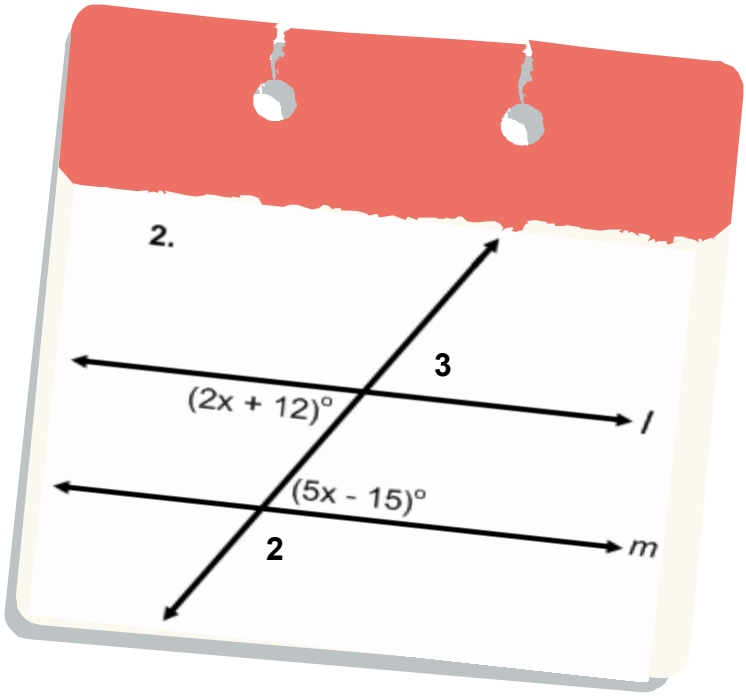
Given that line *l* is parallel to line *m*, solve for *x* in each of the problems, and find the measures of the specific angles.



Show your work:

X = _____

$m\angle 1$ = _____

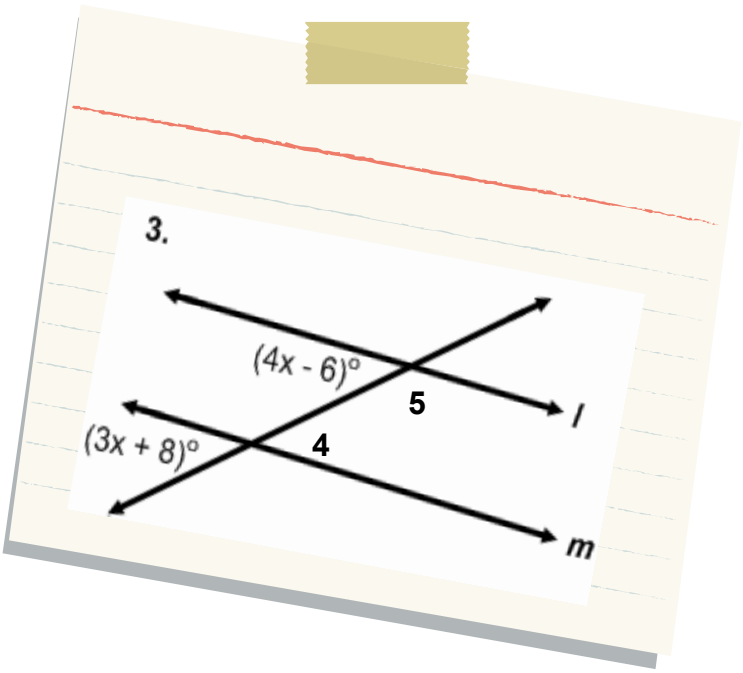


Show your work:

X = _____

$m\angle 2$ = _____ $m\angle 3$ = _____

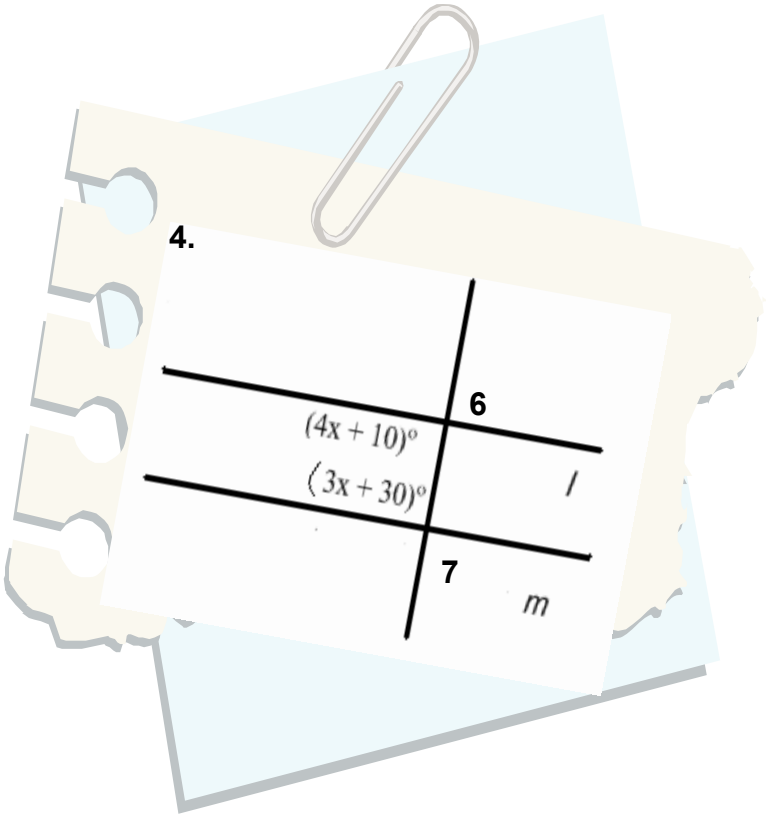
Name_____ Period _____ Date _____



Show your work:

X = _____

$m\angle 4$ = _____ $m\angle 5$ = _____

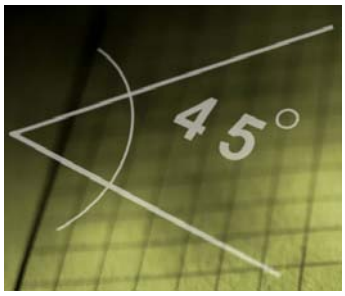


Show your work:

X = _____

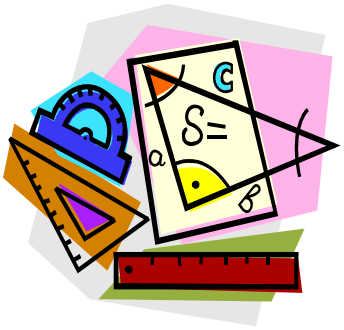
$m\angle 6$ = _____ $m\angle 7$ = _____

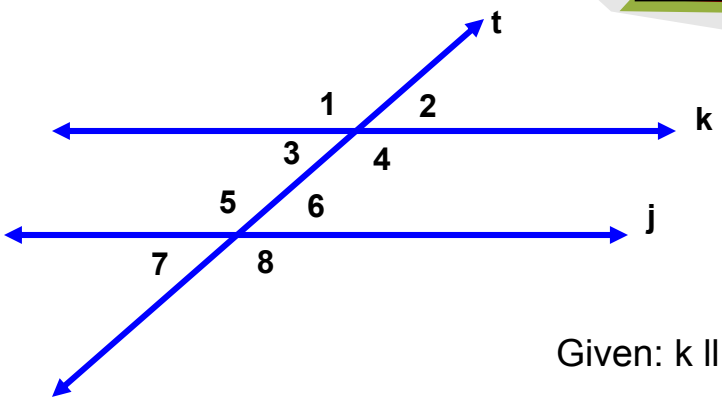
Name: _____ Period: ____ Date:_____



Special Kind of Angles!

(Warm Up)





Given: k ll j

If $m\angle 2 = 25y - 20$ and $m\angle 7 = 13y + 4$, find the value for y and the measure of the indicated angles.

1. The value of y =_____

2. The measure of the following angles.

a) $m\angle 2$ = _____ c) $m\angle 5$ = _____

b) $m\angle 3$ = _____ d) $m\angle 8$ = _____

Where's My Parallel?

(Group Task)

Group Members: _____

_____

_____

_____

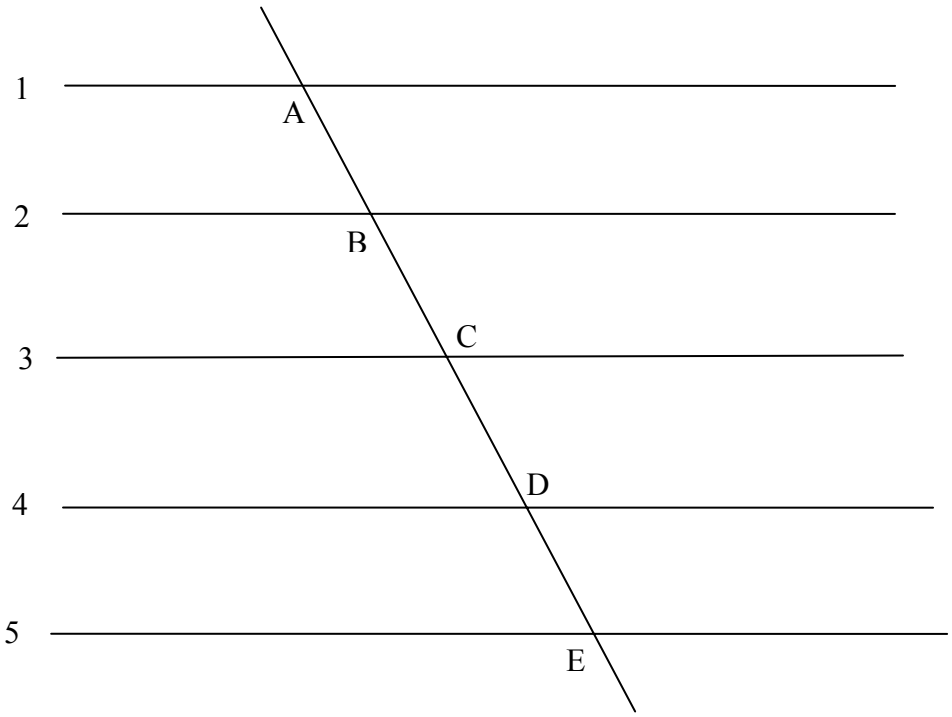
_____

Period: _____

Date: _____

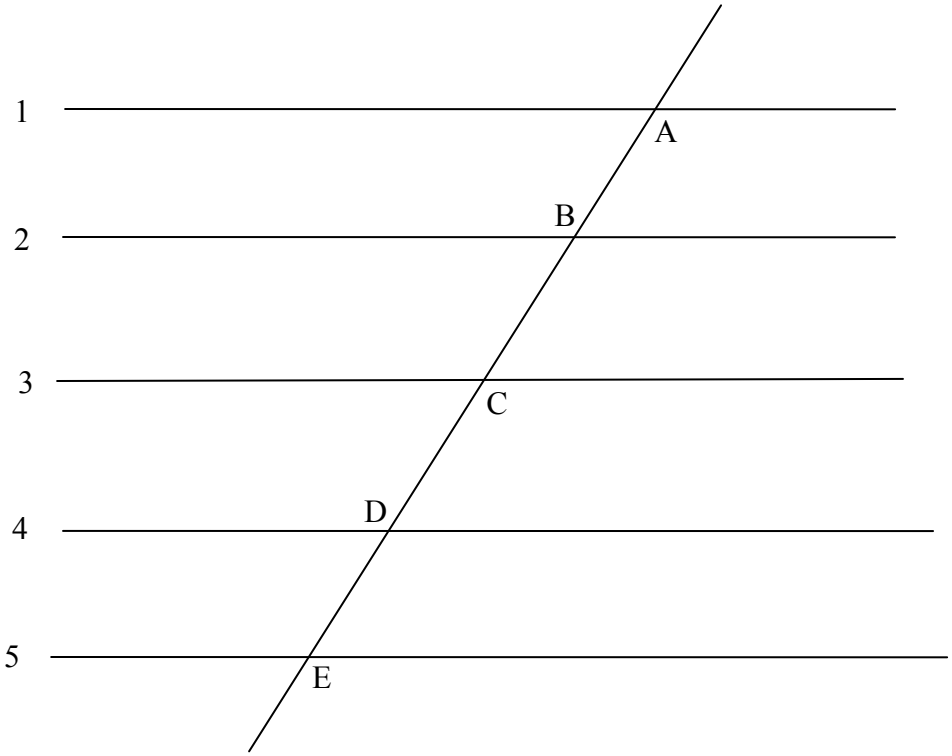
Each team member solves an equation corresponding with their assigned letter (A – E). The solution of the equation is the measure of the angle in the parallel lines figure with the corresponding letter. After each team member has solved for their angle, the whole group works together to determine which lines are parallel from the angles given in the figure. If the lines are parallel, justification must be given (Example**:** Line 1 is parallel to line 2 because angles A and B are congruent corresponding angles).

Problem #1



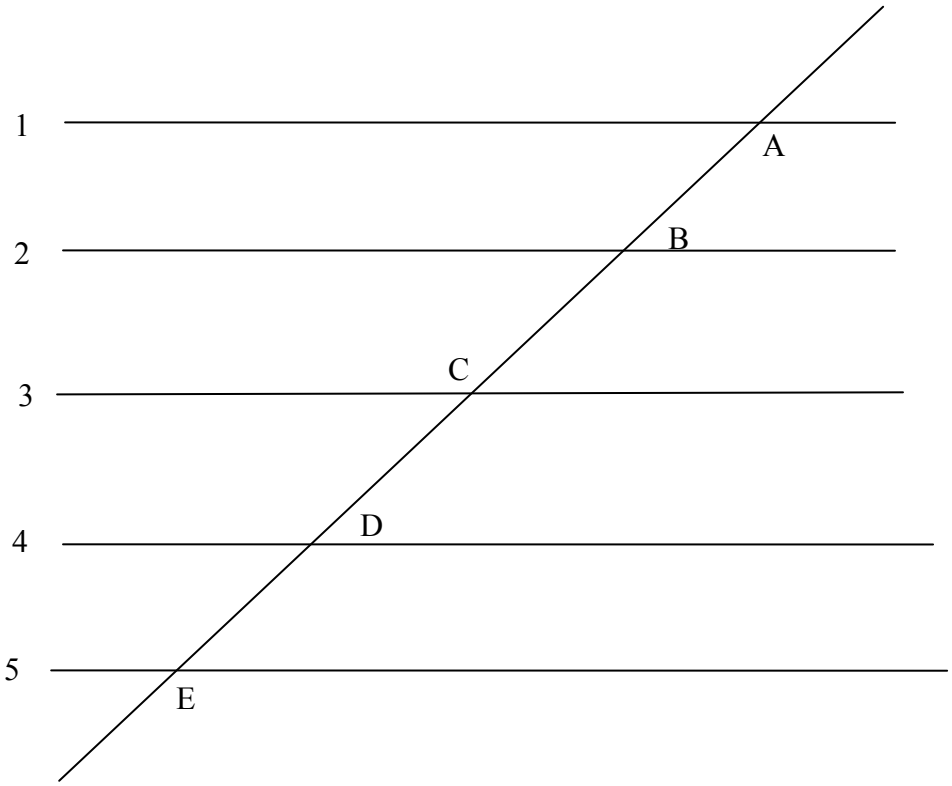
Justify Parallel Lines Below:

Problem #2



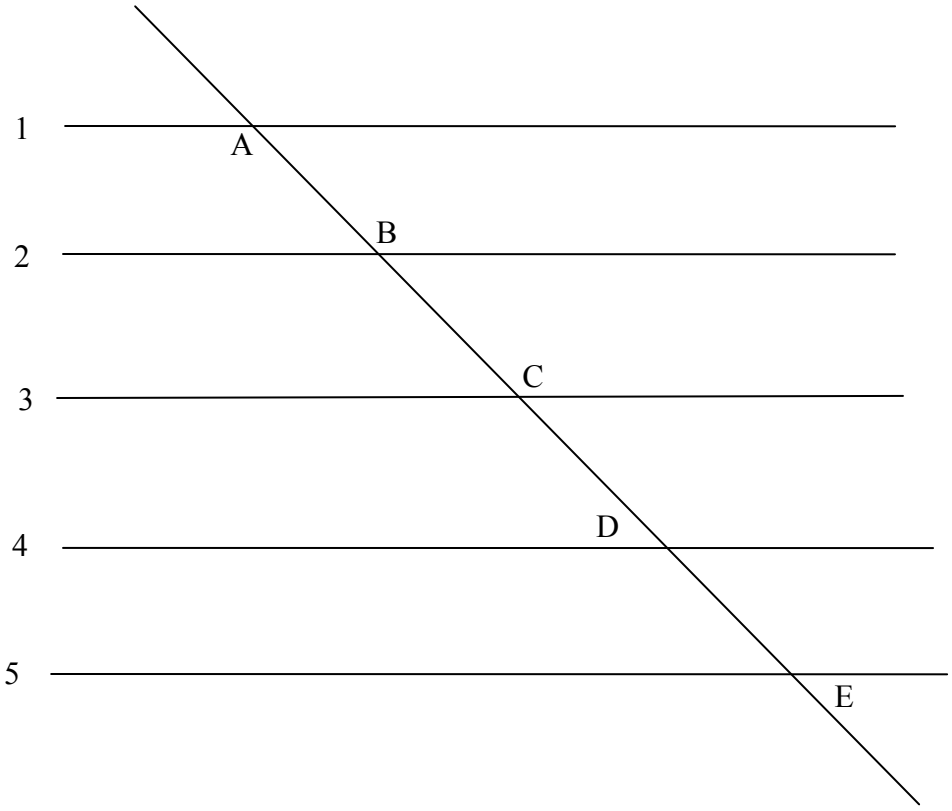
Justify Parallel Lines Below:

Problem #3



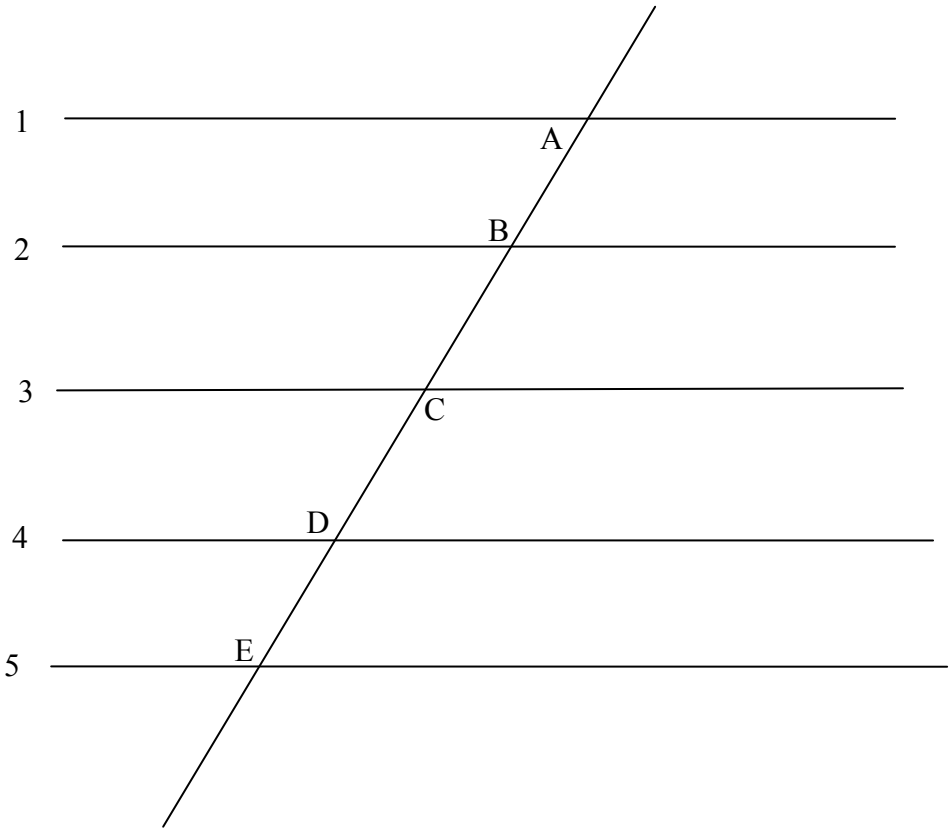
Justify Parallel Lines Below:

Problem #4



Justify Parallel Lines Below:

Problem #5



Justify Parallel Lines Below:

Equation 1A $-3a + 63 = -2(30 + a)$	**Equation 2A** $-2(63 - a) = 3(a - 88) + 29$	**Equation 3A** $3(a - 64) + 458 = 5a$
Equation 1B $-2(15 - b) + 12 = 224$	**Equation 2B** $4b - 84 = 6(171 - b)$	**Equation 3B** $-5b + 462 + 2b = 3(b + 64)$
Equation 1C $4(c - 10) = 2C + 206$	**Equation 2C** $3(c + 64) + 39 = 5c + 9$	**Equation 3C** $4(64 - c) = 123 - 3c$
Equation 1D $-3d + 838 = 5(d - 26)$	**Equation 2D** $4(76 - d) = -2(d - 22) + 38$	**Equation 3D** $6d - 3d = -2(11 - d) + 67$
Equation 1E $3e - 189 = 174$	**Equation 2E** $3e - 160 = 167$	**Equation 3E** $4e - 302 = 230$

Equation 4A	**Equation 5A**
$6a - 418 = 4(a - 64) + 112$	$3a + 27 = 2(a + 45)$
Equation 4B	**Equation 5B**
$4(b - 97) + 2b = 422$	$201 - 3(b + 28) = -2b$
Equation 4C	**Equation 5C**
$86 - 4c = -2(c + 92)$	$-4c + 819 = -2c + 5c$
Equation 4D	**Equation 5D**
$-3(d + 164) + 4d = -2d - 363$	$3(d + 74) = 342 + 2d$
Equation 4E	**Equation 5E**
$-4e = -2e - 86$	$-2e + 78 = 3e - 522$