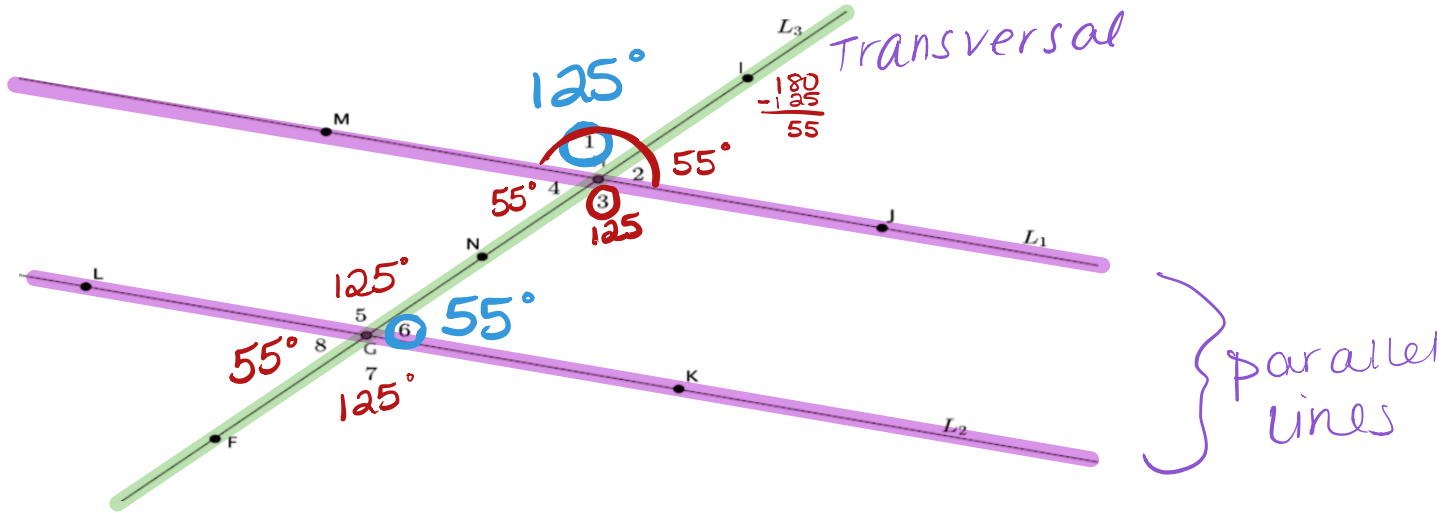# 8-5 Parallel Lines Cut by a Transversal

"I can identify angle relationships that exist when parallel lines are cut by a transversal."
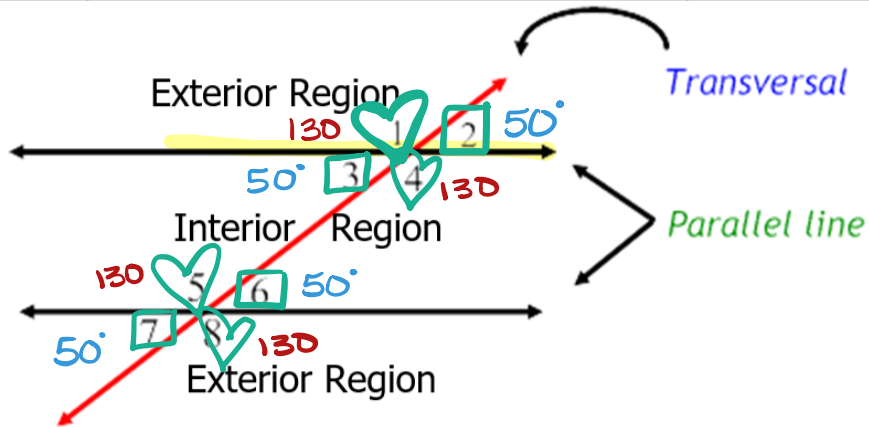
Warm Up: Use the diagram below to list all pairs of vertical angles.

If the measure of <1 = 125⁰ and the measure of <6 = 55⁰, then find the measure of all the other six(6) angles. Write angle measures directly in diagram.

Pairs of Vertical Angles are: < __1__ and < __3__ ;   < __5__ and < __7__

< __2__ and < __4__ ;   < __6__ and < __8__

125°
Transversal
180
-125
55
55°
55° 4
125
125°
55°
55° 8
125°

L_3
M
L_1
N
L
J
K
L_2
F

parallel lines

Guided Practice: Angle Pairs formed by parallel lines being cut by a transversal

Exterior Region   Transversal
130 1 2 50°
50° 3 4 130
Interior Region   Parallel line
130 5 6 50°
50° 7 8 130
Exterior Region

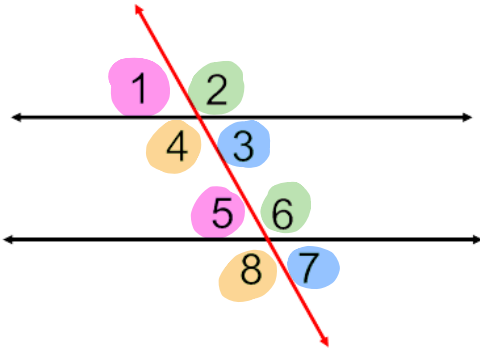## Exercise 1- If m<1 = 130⁰, find measure of the following angles:

m<2 __50°__

m<3 __50°__

m<4 __130°__

Corresponding Angles: congruent

These angles are **congruent angles** located on the **same side of the transversal**. **One is in interior region and one is in exterior region in different intersections**.

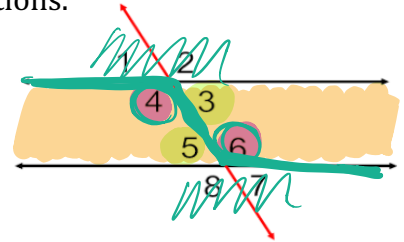List all pairs of **corresponding angles** below:

$\angle 1 \cong \angle 5$ $\angle 4 \cong \angle 8$

$\angle 2 \cong \angle 6$ $\angle 3 \cong \angle 7$

Alternate Interior Angles: congruent

These angles are **congruent angles** located **between the parallel lines in the interior region** and **on opposite sides of the transversal** & at different intersections.

List all pairs of **alternate interior angles** in the diagram:

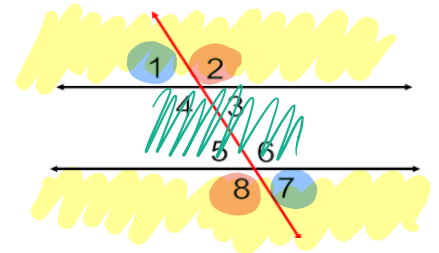$\angle 4 \cong \angle 6$ $\angle 3 \cong \angle 5$

Alternate Exterior Angles: congruent

These angles are **congruent angles** located in the **exterior region** and on **opposite sides of the transversal** & at **different intersections**.

List all pairs of **alternate exterior angles** in the diagram:

$\angle 1 \cong \angle 7$ $\angle 2 \cong \angle 8$

Exercise 2- Name the relationship between each of the following angle pairs:

a)   1 and 8
   alternate Ext.

b)   5 and 8
   vertical

c)   2 and 6
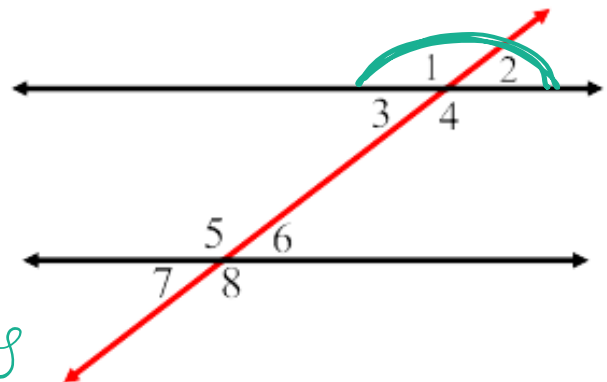   Corresponding

d)   3 and 6
   Alt. Int.

e)   4 and 5
   Alt Int.

f)   3 and 7
   Corresponding

g)   4 and 8
   Corresponding

h)   1 and 2
   Supplementary

*All angles are either congruent or supplementary!

Problem Set:

1. If the m<1 = 60⁰, find the measure of each of the other angles in the diagram below? Name the angle relationship to <1 that may have been used to determine each angle measurement.

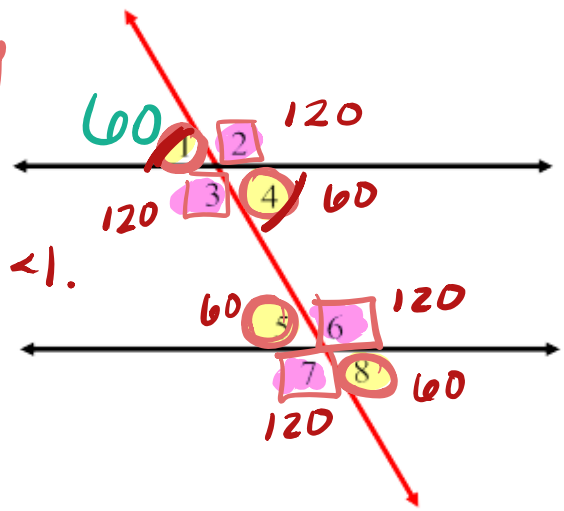m<2 = **120** b/c they are **Supplementary**

m<3 = **120** b/c they are _____

m<4 = **60** b/c they are _____

m<5 = **60** b/c they are **corresponding to <1.**

m<6 = **120** b/c they are _____

m<7 = **120** b/c they are _____

m<8 = **60** b/c they are _____

2. Which of the following is true when parallel lines are cut by a transversal?

   (1) Vertical angles are supplementary.
   (2) Alternate exterior angles are supplementary.
   (3) Alternate interior angles are complementary.
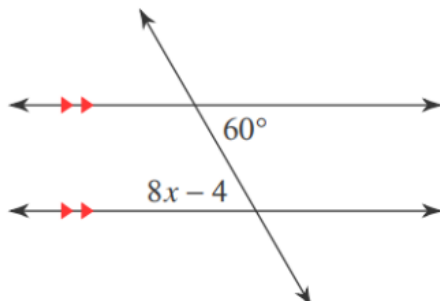   (4) Corresponding angles have the same measure.

3. Lines m and n are parallel in the figure below. What is the measure of angle x? <u>Explain</u> your answers.

[not drawn to scale]
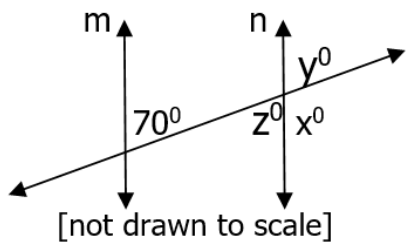
4. Lines l and m are parallel and cut by transversal t. The m<8=115⁰. Find the measure of the other angles in diagram.

5. Challenge: Solve for x

Name_____   Date_____

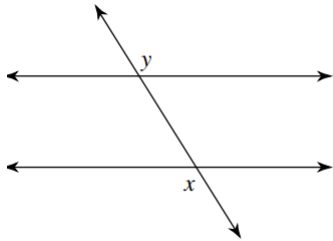Unit 8: Angle Relationships   Math 8R
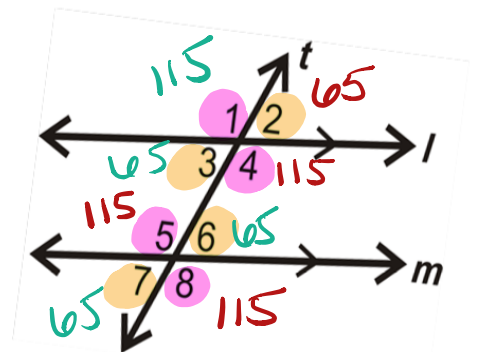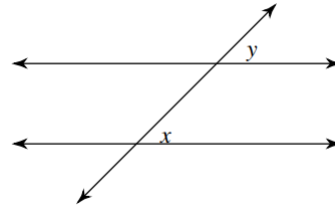
8-5 Parallel Lines Cut by a Transversal
Homework

Identify each pair of angles as corresponding, alternate interior, or alternate exterior.
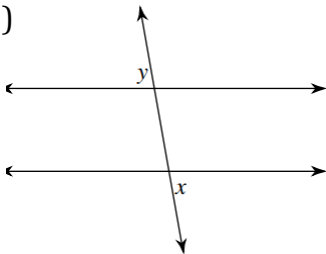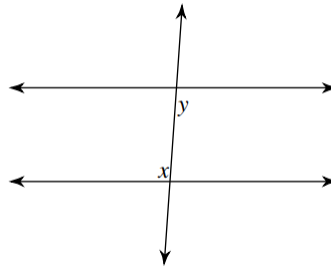
1)

2)

3)

4)

Find the measure of each of the indicated angles. Justify by stating the angle relationship.

?
110°

84°
?

100°
?

53°
?

?
113°

?
111°