U13 TOPIC 4: Parallel Lines Cut by a Transversal

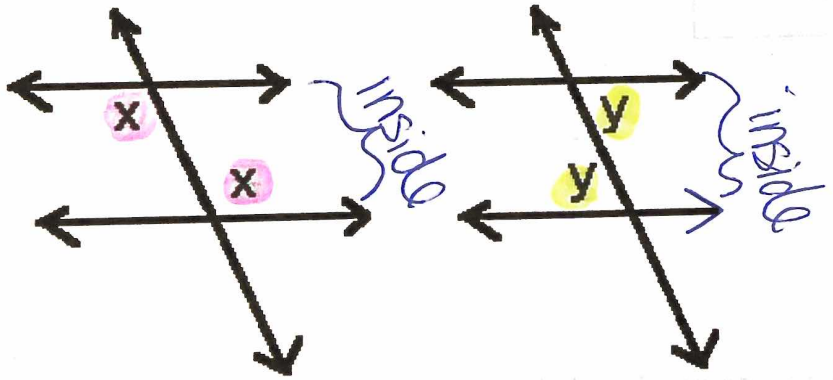
Aim: What is the relationship between the angles formed when **parallel lines** are intersected?

Important Vocabulary

- **Parallel lines** are two lines that are in the same plane that never intersect. They are always equidistant from each other. **Symbol:** ||
- **Perpendicular lines** are two lines that intersect to form right angles. **Symbol:** ⊥
- A **transversal** is a line that intersects two or more parallel lines that lie in the same plane.

Congruent Angles Formed By a Transversal

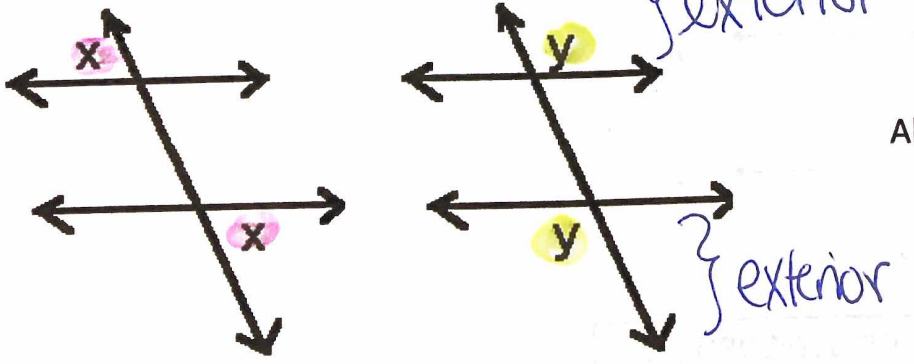
ALTERNATE INTERIOR ANGLES



inside the || lines

Alternate Interior Angles are congruent.

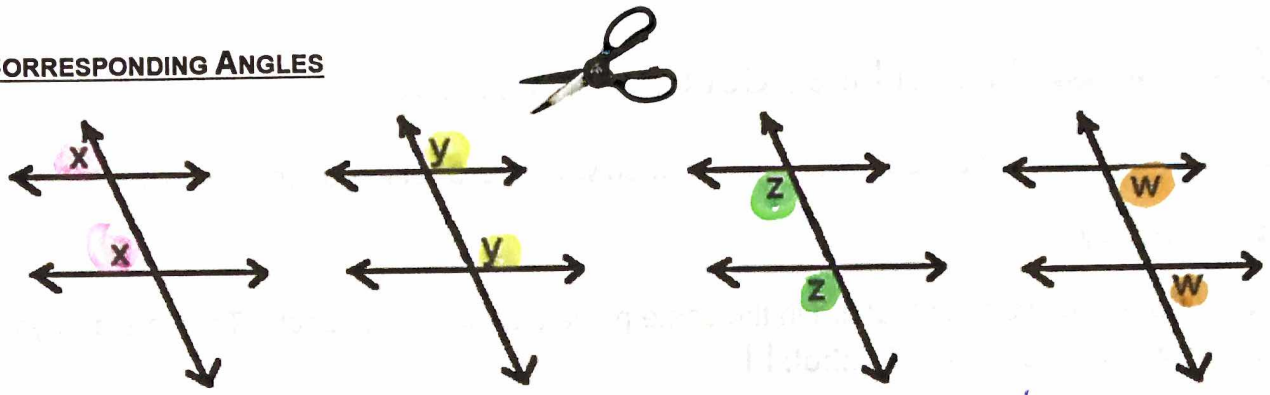
ALTERNATE EXTERIOR ANGLES



outside || lines

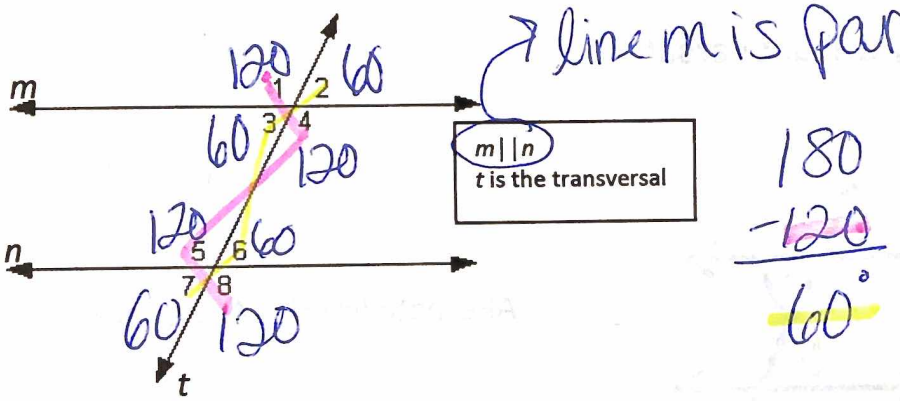
Alternate Exterior Angles are congruent.

CORRESPONDING ANGLES



Corresponding Angles are congruent.

Example 1: If m<1 is 120°, find the measure of each of the missing angles in the diagram below.



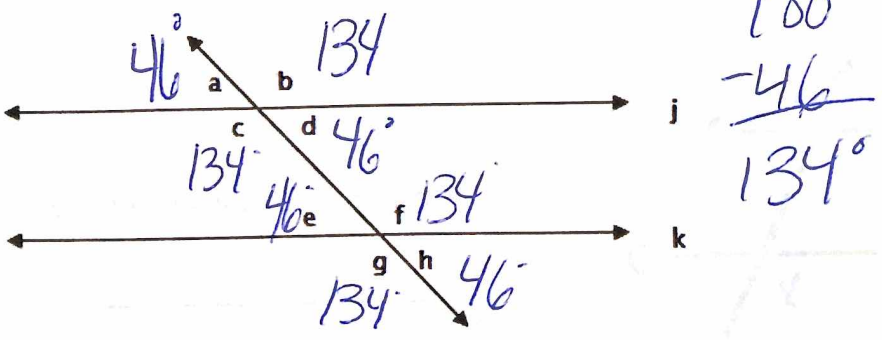
line m is parallel to line n

"read it"

$m \parallel n$
t is the transversal

180
−120
60°

Example 2: In the figure below $j \parallel k$. If the measure of angle h is 46°, find the measure of each of the missing angle.



180
−46
134°

SUMMARY → 3 NEW ANGLE RELATIONSHIPS

- Alternate Interior
- Alternate exterior
- Corresponding

4 PREVIOUS ANGLE RELATIONSHIPS

- Vertical
- Supplementary
- Complimentary
- Angles at a point

congruent (=)

Example 3: If angle *t* measures 40° and its corresponding angle *w* measures (2x + 10)°, find the measure of x.

$40 = 2x + 10$

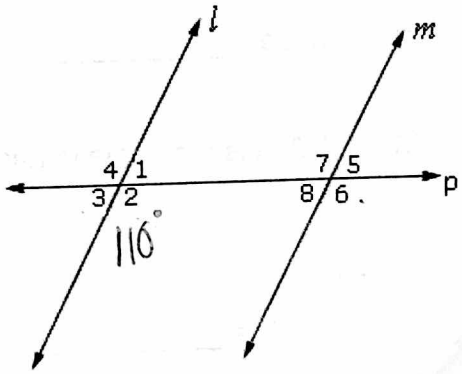
$-10 \quad -10$

$\frac{30}{2} = \frac{2x}{2}$

$x = 15$

Try It!

#1-2 In the diagram below $l \parallel m$ and *p* is the transversal. If the m<2 is 110°;



1.) Name the **angle relationship** of:

a) <2 and <6 _____

b) <2 and <1 _____

c) <3 and <5 _____

d) <1 and <8 _____

e) <8 and <5 _____

2) Find the measure of **all** the missing angles.

3) AB and CD are two parallel lines and EF is the transversal. Write and solve an equation to find the value of x. Be certain to justify your work. State their relationship.

Relationship: _____