

What are parallel lines? never intersect  
& on the same plane.

What symbol means parallel?  $m \parallel n$

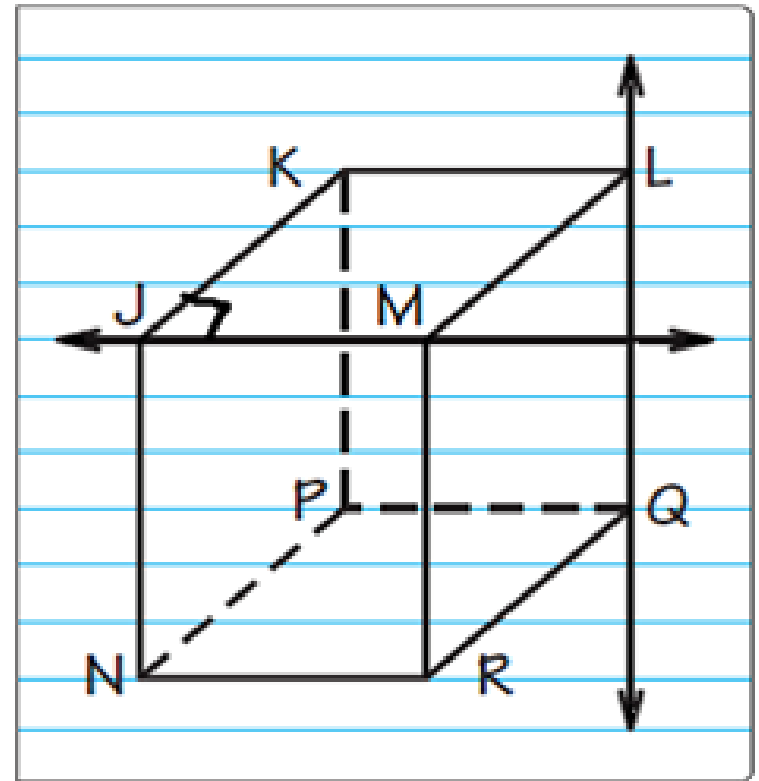
Skew lines- on different planes  
& never intersect

Parallel planes- 2 planes that never  
intersect

Perpendicular lines -  
intersect at a  $90^\circ$  angle  
 $m \perp g$

Look at our drawings.

Which lines or figures appear to fit the description?



a. Line(s) parallel to  $\overleftrightarrow{JK}$  and containing point M.

b. Line(s) skew to  $\overleftrightarrow{JK}$  and containing point M.

c. Line(s) perpendicular to  $\overleftrightarrow{JK}$  and containing point M.

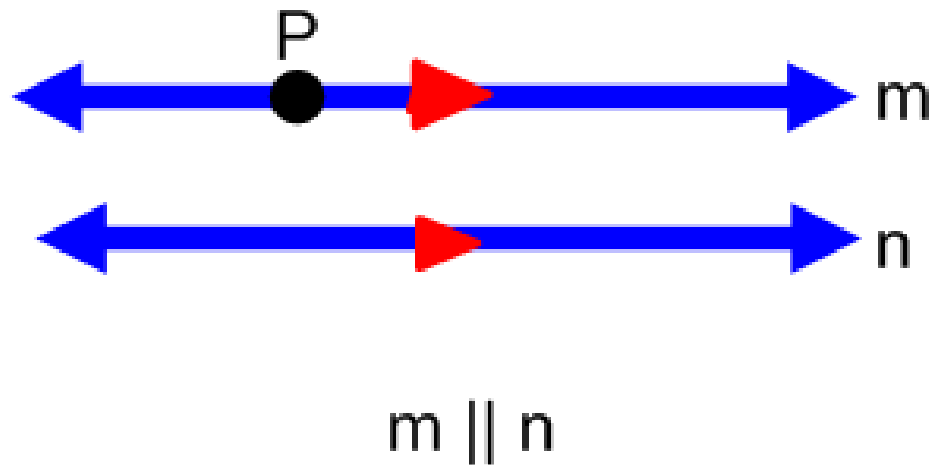
d. Plane(s) parallel to plane NPQ and containing point M.

Plane JML.

If we have a line and a point not on the line, how many lines through that point will be parallel to the given line?

### **Parallel Postulate**

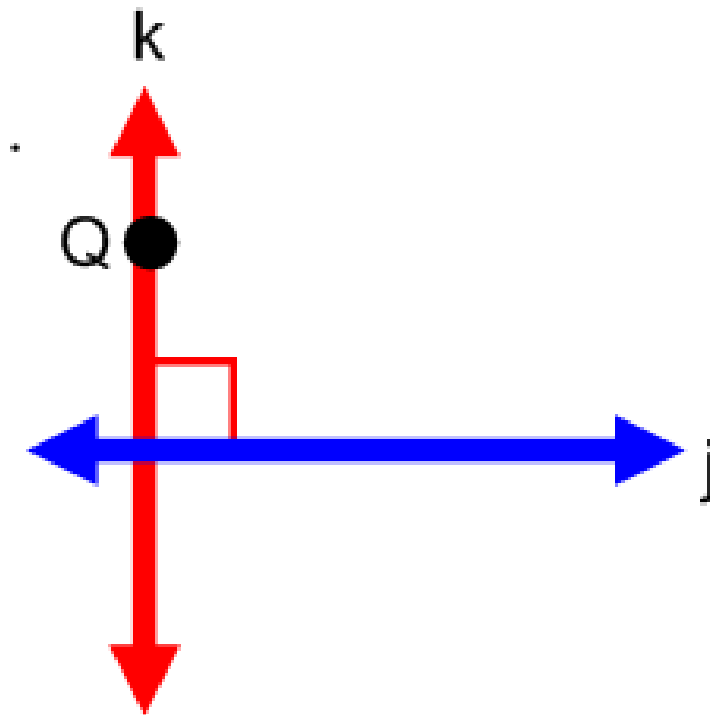
If there is a line and a point not on the line, then there is exactly one line through the point that is parallel to the given line.



If we have a line and a point not on the line, how many lines through that point will be perpendicular to the given line?

## Perpendicular Postulate

If there is a line and a point not on the line, then there is exactly one line through the point that is perpendicular to the line.



$j \perp k$

transversal

### Corresponding Angles

F shape

$\angle 1 \leftrightarrow \angle 5$      $\angle 4 \leftrightarrow \angle 8$   
 $\angle 2 \leftrightarrow \angle 6$   
 $\angle 3 \leftrightarrow \angle 7$

### Alternate Interior Angles

Z shape

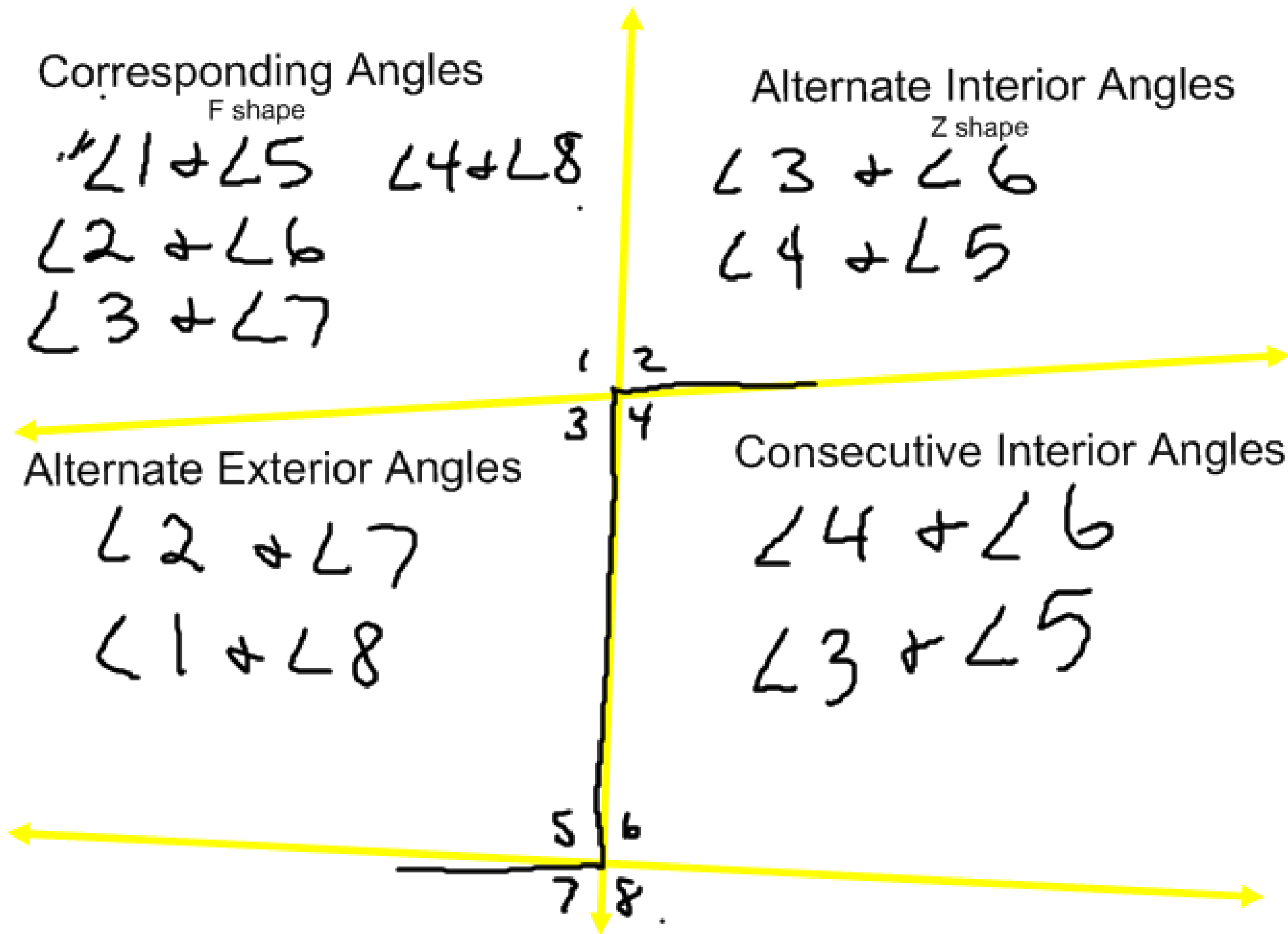
$\angle 3 \leftrightarrow \angle 6$   
 $\angle 4 \leftrightarrow \angle 5$

### Alternate Exterior Angles

$\angle 2 \leftrightarrow \angle 7$   
 $\angle 1 \leftrightarrow \angle 8$

### Consecutive Interior Angles

$\angle 4 \leftrightarrow \angle 6$   
 $\angle 3 \leftrightarrow \angle 5$



Name the corresponding, alternate interior, alternate exterior, and consecutive interior angles.

corresponding:

$\angle 11$  &  $\angle 15$ ,  $\angle 13$  &  $\angle 17$   
 $\angle 12$  &  $\angle 16$ ,  $\angle 14$  &  $\angle 18$

alternate interior:

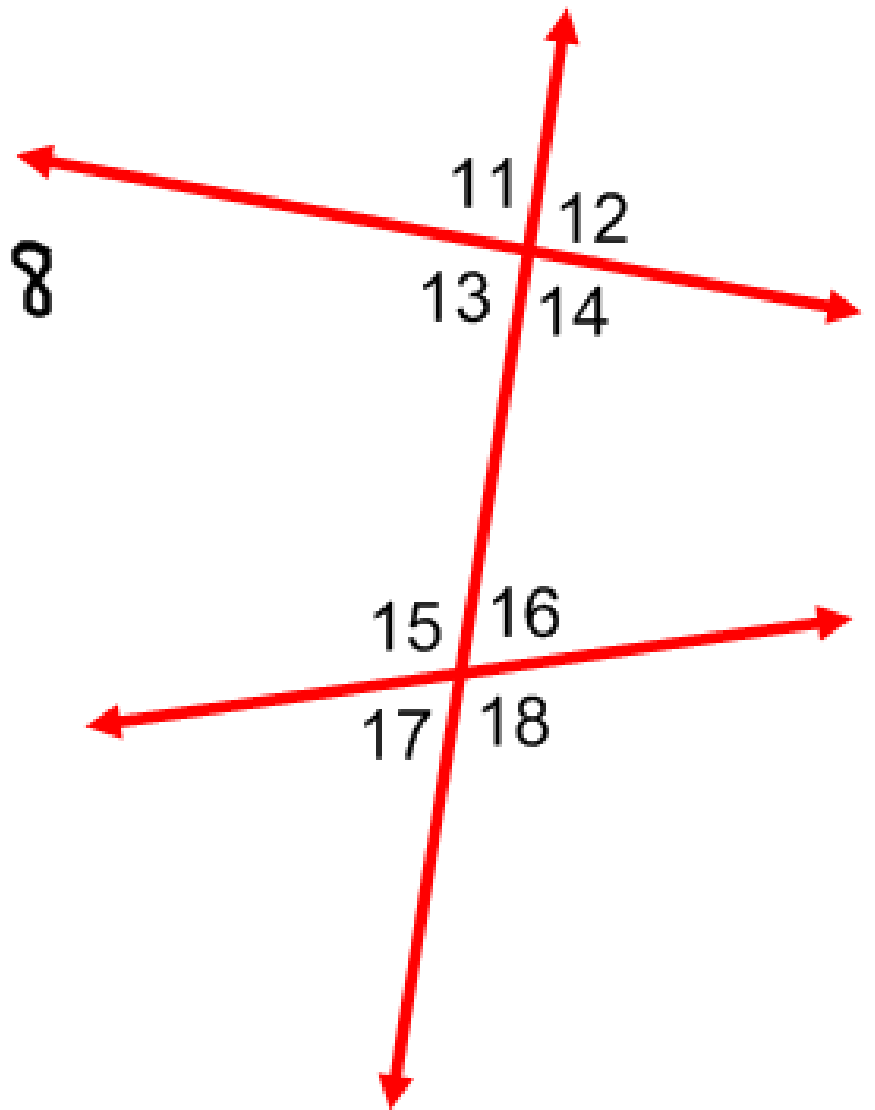
$\angle 14$  &  $\angle 15$ ,  $\angle 16$  &  $\angle 13$

alternate exterior:

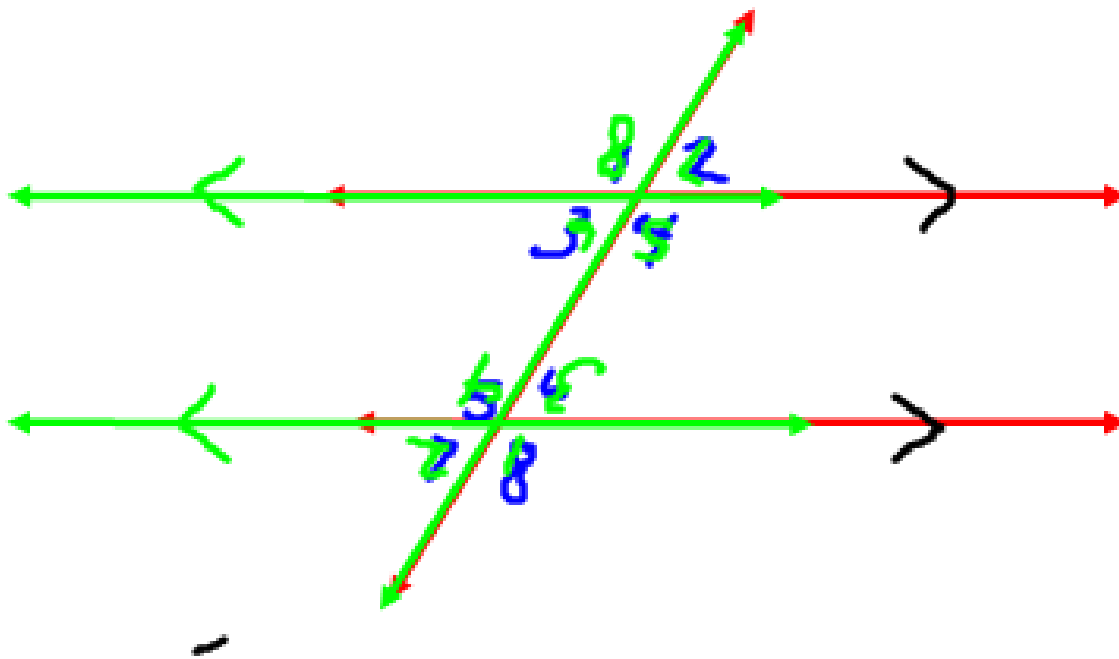
$\angle 12$  &  $\angle 17$ ,  $\angle 11$  &  $\angle 18$ .

consecutive interior:

$\angle 13$  &  $\angle 15$ ,  $\angle 14$  &  $\angle 16$

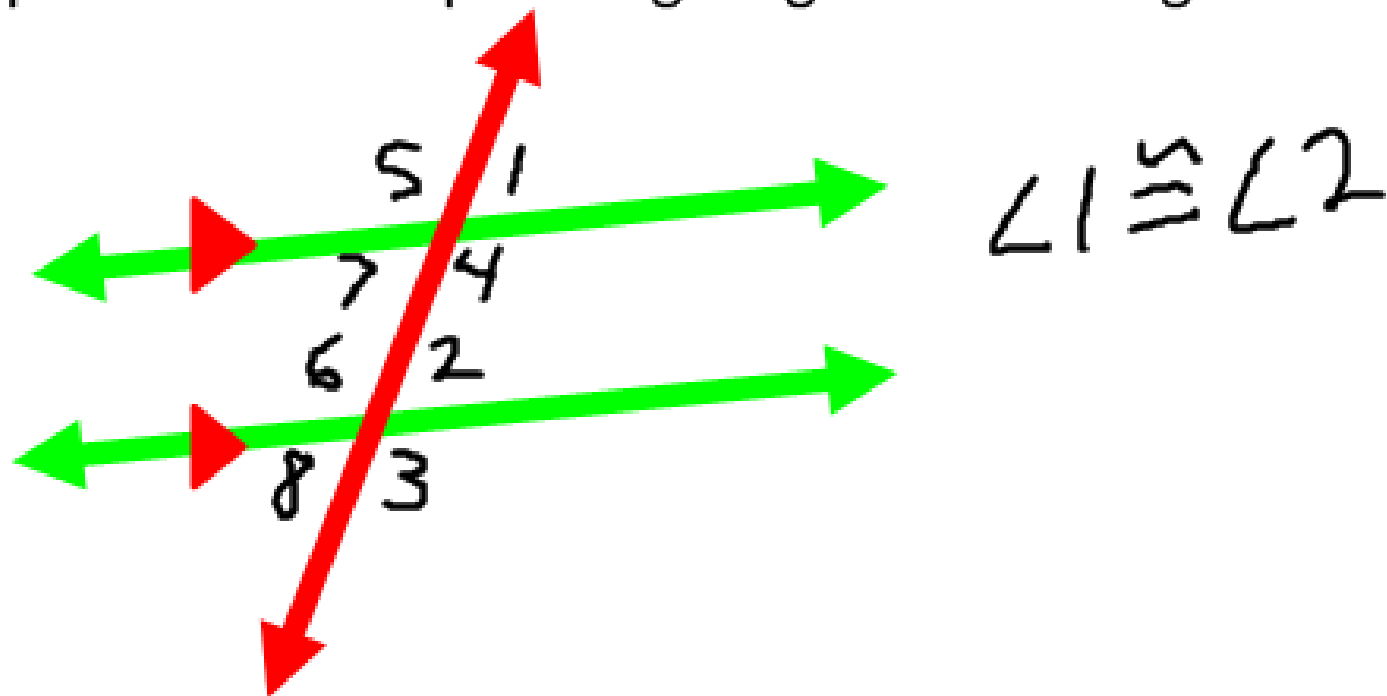


Tracing Activity  
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## Corresponding Angles Postulate

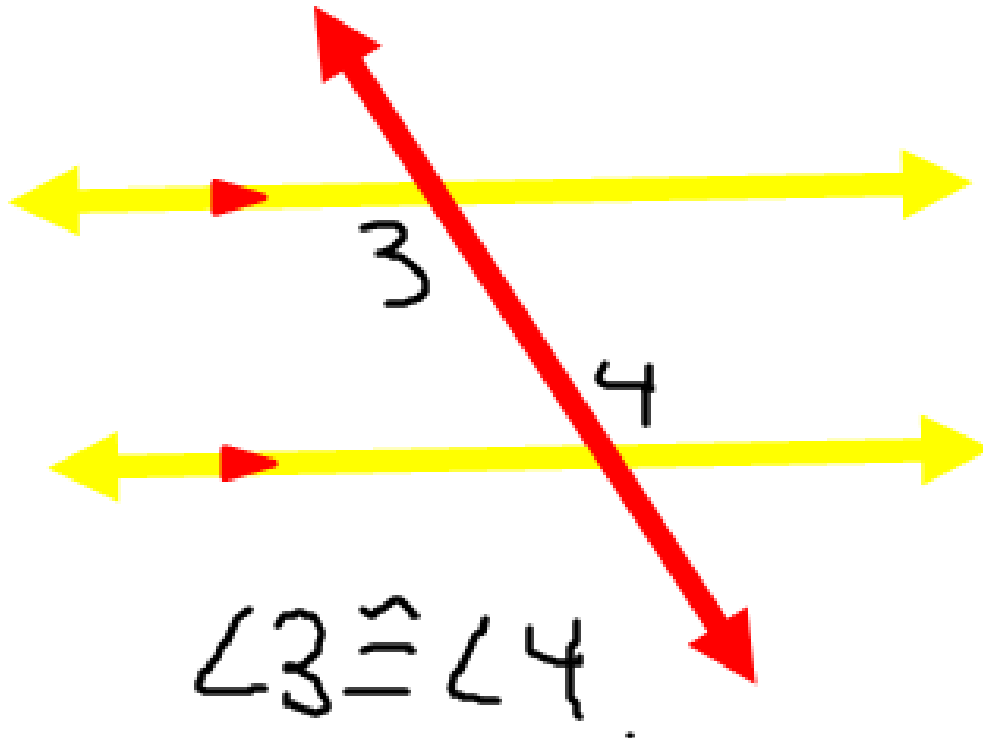
If 2 parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.



What if  $m\angle 3 = 100$ ? What are 3 other angle measures and how do we know?

## Alternate Interior Angles Thm

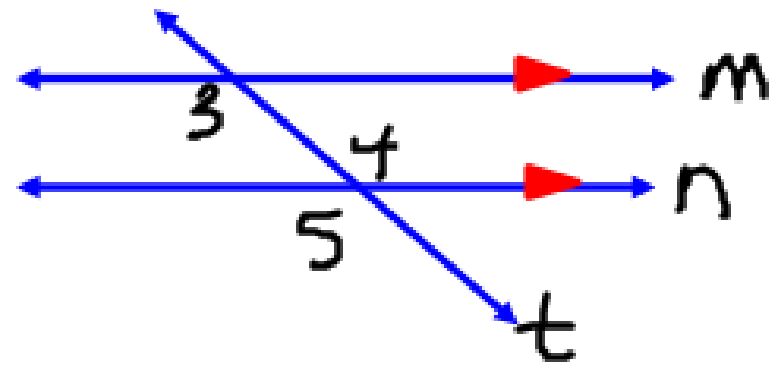
If 2 parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.



## Proof for Alternate Interior Angles Thm

Given:  $m \parallel n$ ,  $t$  is  
a transversal

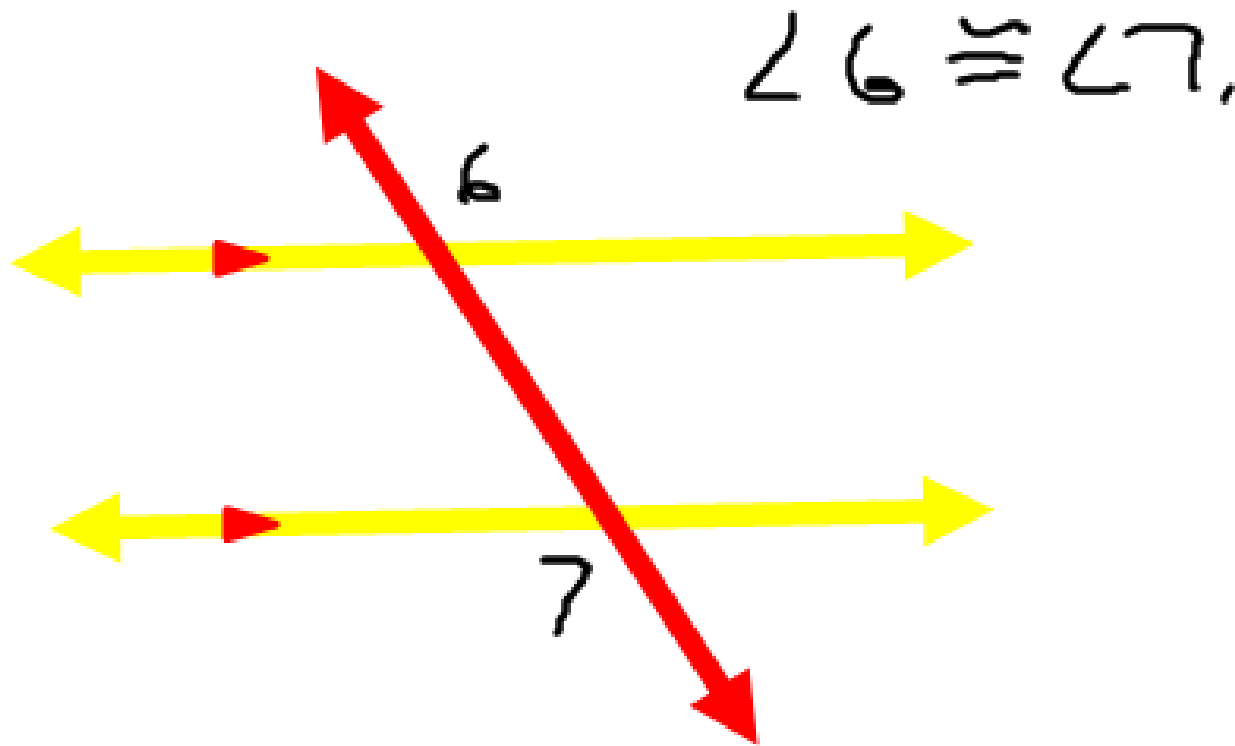
Prove:  $\angle 3 \cong \angle 4$ .



STATEMENTS	REASONS
1. $m \parallel n$ , $t$ is a transversal	1. Given
2. $\angle 4 \cong \angle 5$	2. Vertical $\angle$ 's $\cong$ Thm.
3. $\angle 5 \cong \angle 3$	3. Corresponding $\angle$ 's Post.
4. $\angle 3 \cong \angle 4$	4. Transitive Prop of $\cong$

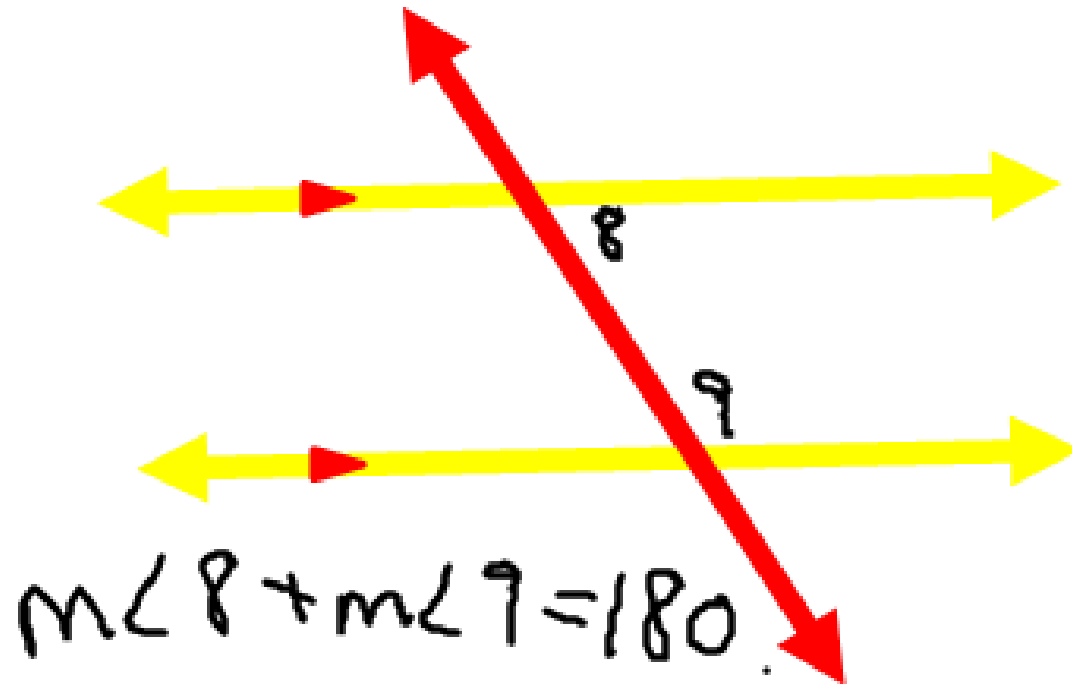
## Alternate Exterior Angles Thm

If 2 parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent.

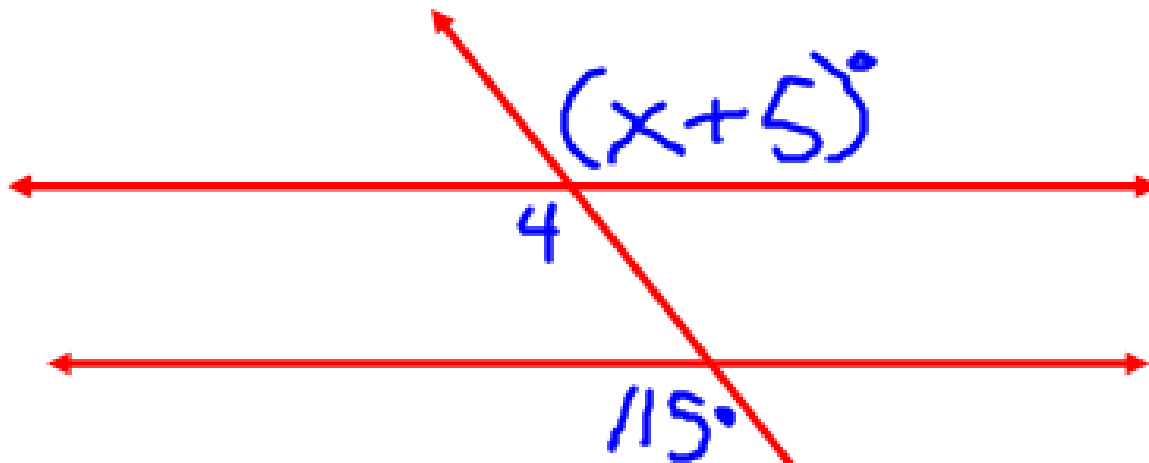


## Consecutive Interior Angles Thm

If 2 parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary.



Solve for x.



$$m\angle 4 = 115^\circ$$

$$115 = x + 5$$

$$110 = x$$

Corresponding  $\angle$ 's Post.

Vertical  $\angle$ 's  $\cong$  Thm.

Homework:

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#'s 1-6, 11-14, 16, 17, 18-28E

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#'s 1, 2, 10-18E, 22, 24, 37, 41