

Geometry: 3.3 Proofs with Parallel Lines

In 3.2 we learned that corresponding angles, alternate interior angles, and alternate exterior angles were congruent for Parallel lines. Also that consecutive interior angles were Supplementary for Parallel lines.

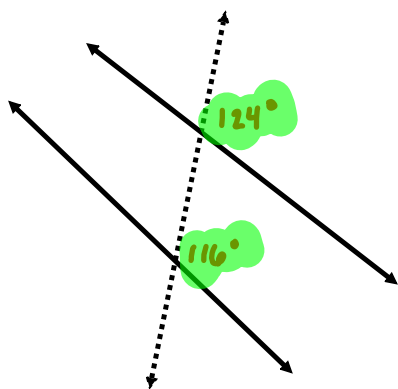
Today we'll be going over some Theorems that are about this relationship.

The theorem names are not important right now. Just know what the theorem Means and how to apply it. I'll be color coding the theorems in red.

Theorem 3.5: Corresponding Angles Converse

If two lines are cut by a transversal so the corresponding angles are congruent, then the lines are parallel.

Basically. If someone claims that corresponding angles are congruent, the lines Must be parallel.

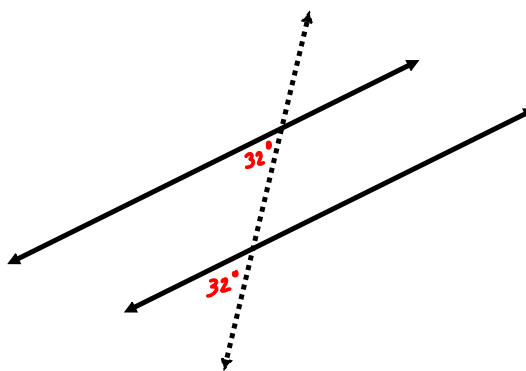


Ex: Prove these lines are or are not parallel.

The angles given are corresponding angles, and they are not congruent, therefore the solid lines are not parallel.

Ex 2: Prove that the solid lines below are or are not parallel.

The angles given are corresponding angles & they are congruent, therefore the lines are parallel.



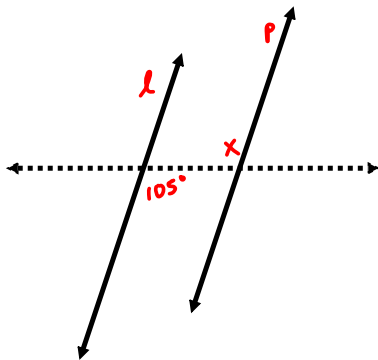
Lesson 3.3 Proofs with Parallel Lines

There are theorems for All the other types of angles we've been studying, and they are all very similar.

Theorem 3.6 Alternate Interior Angles Converse

If two lines are cut by a transversal so the alternate interior angles are congruent, then the lines are parallel.

Basically it's the same as before. If someone claims alternate interior angles are congruent, the lines Must be parallel.

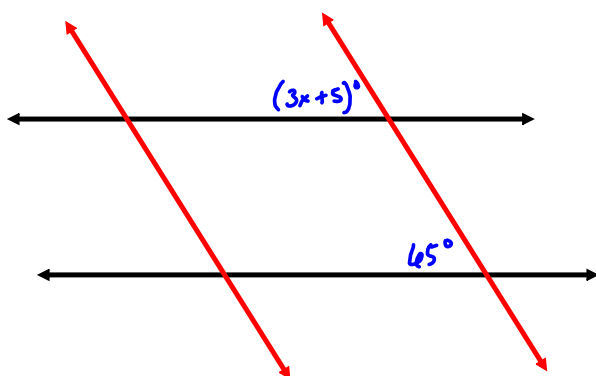


Ex: What must x equal for lines L and P to be parallel?

X must equal 105°

Lesson 3.3 Proofs with Parallel Lines

Ex: What must x equal for the lines N and M to be parallel? Explain your answer.



$$3x+5 = 65$$

$$\begin{array}{r} -5 \\ -5 \end{array}$$

$$\frac{3x}{3} = \frac{60}{3}$$

$$x = 20$$

plugging 20 in for x would make $3x+5$ be 65.
both angles are 65° and they are corresponding angles
therefore the lines are parallel.

The other theorems are what you may expect.

Theorem 3.7 Alternate Exterior Angles Converse

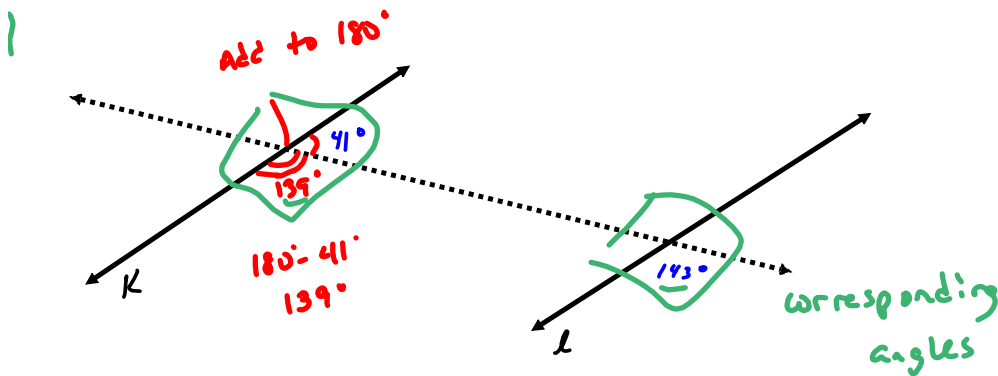
If two lines are cut by a transversal so the alternate exterior angles are congruent, then the lines are parallel.

Theorem 3.8 Consecutive Interior Angles Converse

If two lines are cut by a transversal so the consecutive interior angles are supplementary, then the lines are parallel.

Making inferences:

Are the lines K and L parallel? Why or why not?



lines l & k are Not parallel because the corresponding angles are Not congruent.

Homework:

Pages 130-131

Numbers: 3-7, 21-24

Tip on 6 & 7: If the angles are supposed to be congruent, set them equal to each other. If they are supposed to be supplementary, add them together and set it equal to 180. Don't let the x's confuse you. Do the same thing.