Geometry
Unit: Introduction to Geometry
Section: Parallel and Perpendicular Lines

Tutorial: Parallel Lines And Transversals

Slide 1
In this tutorial, you will learn about Transversals, Corresponding Angles, Alternate Interior Angles, Alternate Exterior Angles, Same-side Interior Angles and Same-side Exterior Angles

Slide 2
In this figure, AB and CD are parallel lines.
Line SR cuts across the parallel lines. Line SR is called a transversal. It intersects AB at point E and CD at point F.

Slide 3 Corresponding angles are angles that are on the same side of the transversal and on the same side of one of the parallel lines. Corresponding angles are congruent.

In our figure angle AER is congruent to angle CFE.
Angle AES is congruent to angle CFS.
Angle REB is congruent to angle RFD.
Angle SEB is congruent to angle SFD.

Slide 4
Alternate Interior Angles are located between the parallel lines and on opposite sides of the transversal.

Angles AEF and DFR are alternate interior angles.

Angles BEF and CFE are also alternate interior angles.

Alternate interior angles are congruent, so angle AEF is congruent to angle DFR and angle BEF is congruent to angle CFE.

Slide 5
Alternate Exterior Angles are located outside of the parallel lines and on opposite sides of the transversal.

Angles REA and DFS are alternate exterior angles

Angles CFS and REB are also alternate interior angles.

These pairs of alternate exterior angles are congruent

So, angle REA is congruent to angle DFS and angle CFS is congruent to angle REB.

Slide 6
You may have noticed that there are acute angles and obtuse angles formed by the parallel lines and the transversal. There are three rules to remember that will help you in solving problems involving parallel lines and transversals.

First, all of the acute angles are congruent.

Second, all of the obtuse angles are congruent.

Finally, the measure of an obtuse angle plus the measure of an acute angle is one hundred and eighty degrees.

Slide 7
If the measure of angle AER is one hundred and forty degrees, what is the measure of angle DFS?

Since they are alternate exterior angles, they are congruent. Angle DFS is also one hundred and forty degrees.

If the measure of angle REB is thirty degrees, what is the measure of angle CFE?

Since angle REB is acute and angle CFE is obtuse, their sum must be one hundred and eighty degrees. Therefore, angle CFE measures one hundred and fifty degrees.

Slide 8
Now you try.
Answer the following question based on the figure below. Click on Solution to check your work.

Which angles are congruent to angle AEF?

Solution:
Angle REA, angle REB, angle BES, angle CFR, angle RFD, angle SFD, angle SFC

Slide 9
In this tutorial, you learned about Transversals, Corresponding Angles, Alternate Interior Angles, and Alternate Exterior Angles.