

3.5 Showing Lines are Parallel

- Objective:
1. Recognizing and writing converse statements.
 2. Showing two lines are parallel using angle relationships.

The converse of an if-then statement is the statement formed by switching the hypothesis and the conclusion.

Checkpoint at the bottom of pg. 136

1. If 2 \angle s are \cong , then the 2 \angle s have the same measure.

True

2. If the $m\angle 3 + m\angle 4 = 90^\circ$, then $\angle 3$ and $\angle 4$ are complementary.

True

3. If $\angle 1 \cong \angle 2$, then $\angle 1$ and $\angle 2$ are right \angle s.

False

The information from lesson 3.4 about angle relationships still applies in this lesson. The difference is the order the information is given.

In lesson 3.4 you were told the lines were parallel and therefore:

- corresponding angles were congruent
- alternate interior angles were congruent
- alternate exterior angles were congruent
- same-side interior angles were supplementary **SSS**

and then you were asked for missing angle measures.

In today's lesson you are going to be given angle measurements. You will have to decide if they fit the above criteria. If they do, the lines are parallel and if they don't, the lines are not parallel.

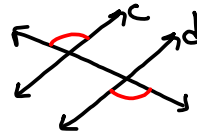
Converse of Corresponding Angles Postulate: If two lines are cut by a transversal so that corresponding angles are congruent, then the lines are parallel.

Converse of Alternate Interior Angles Theorem: If two lines are cut by a transversal so that alternate interior angles are congruent, then the lines are parallel.

Converse of Alternate Exterior Angles Theorem: If two lines are cut by a transversal so that alternate exterior angles are congruent, then the lines are parallel.

Converse of Same-Side Interior Angles Theorem: If two lines are cut by a transversal so that same-side interior angles are supplementary, then the lines are parallel.

Checkpoint in the middle of pg. 138



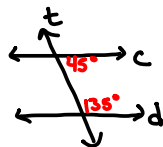
$c \parallel d$
Converse of the Alternate Exterior \angle s Thm

Checkpoint in the middle of pg. 139

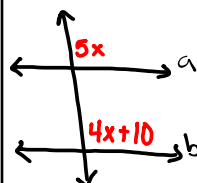
$$8. \begin{array}{r} 2x + 70 = 180 \\ -70 \quad -70 \\ \hline 2x = 110 \\ \frac{2x}{2} = \frac{110}{2} \\ x = 55 \end{array}$$

$$9. \begin{array}{r} 2x + 4x = 180 \\ 6x = 180 \\ \frac{6x}{6} = \frac{180}{6} \\ x = 30 \end{array}$$

$$10. \begin{array}{r} x + 22 + 90 = 180 \\ x + 112 = 180 \\ -112 \quad -112 \\ \hline x = 68 \end{array}$$



$45 + 135 = 180$
 $c \parallel d$
Converse of the Same-Side Interior \angle s Thm



$$\begin{array}{r} 5x = 4x + 10 \\ -4x \quad -4x \\ \hline x = 10 \end{array}$$

Name

3.5

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