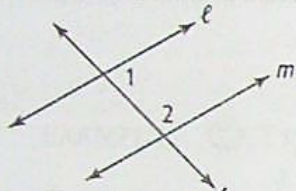


Topic 2-2 "Proving Parallel Lines"

1.9 ESSENTIAL QUESTION What angle relationships can be used to prove that two lines intersected by a transversal are parallel?

- ≡ alternate interior angles
- ≡ alternate exterior angles
- ≡ corresponding angles
- supp. same-side interior angles
- supp same-side exterior angles

2. **Error Analysis** Noemi wrote, "If $\angle 1 \cong \angle 2$, then by the Converse of the Same-Side Interior Angles Postulate, $l \parallel m$." Explain the error in Noemi's reasoning. **MP.3**



Noemi should have noted that $m\angle 1 + m\angle 2 = 180$
(same-side interior angles that are supp $\Rightarrow \parallel$ lines)

3. **Vocabulary** How does a flow proof show logical steps in the proof of a conditional statement?

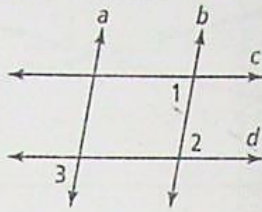
A flowproof shows a theorem, property, or definition in each step accompanied by a reason. Arrows show the order of logical steps leading from hypothesis to conclusion.

4. **Reason** How is Theorem 2-9 a special case of the Converse of the Corresponding Angles Theorem? **MP.2**

The converse of the Corresponding Angles Thm applies to corresponding angles of any measure, but Thm 2-9 applies to corresponding angles that are both right angles.

DO YOU KNOW HOW?

Use the figure shown for Exercises 5 and 6.



5. If $\angle 1 \cong \angle 2$, which theorem proves that $c \parallel d$?

If alternate interior angles are congruent, then they imply parallel lines. (Converse of alt int \angle 's Thm)

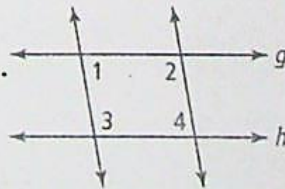
6. If $m\angle 2 = 4x - 6$ and $m\angle 3 = 2x + 18$, for what value of x is $a \parallel b$? Which theorem justifies your answer?

(Alternate Ext \angle 's are \cong)

$$\begin{aligned} \therefore 4x - 6 &= 2x + 18 \\ 2x &= 24 \\ \boxed{x = 12} \end{aligned}$$

If alt. ext \angle 's $\cong \Rightarrow \parallel$ lines

7. Using the Converse of the Same-Side Interior Angles Postulate, what equation shows that $g \parallel h$?



$$m\angle 1 + m\angle 3 = 180$$

$$m\angle 2 + m\angle 4 = 180$$