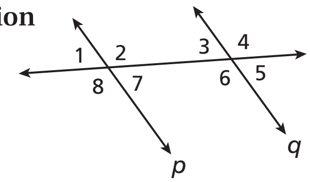
3-3 Proving Lines Parallel *(pp. 162–169)*

EXAMPLES

Use the given information and theorems and postulates you have learned to show that $p \parallel q$.



- $m\angle 2 + m\angle 3 = 180°$

  $\angle 2$ and $\angle 3$ are supplementary, so $p \parallel q$ by the Converse of the Same-Side Interior Angles Theorem.

- $\angle 8 \cong \angle 6$

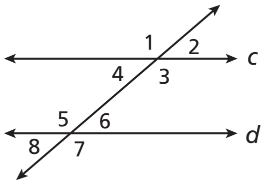
  $\angle 8 \cong \angle 6$, so $p \parallel q$ by the Converse of the Corresponding Angles Postulate.

- $m\angle 1 = (7x - 3)^{\circ}$, $m\angle 5 = 5x + 15$, $x = 9$

  $m\angle 1 = 60°$, and $m\angle 5 = 60°$. So $\angle 1 \cong \angle 5$. $p \parallel q$ by the Converse of the Alternate Exterior Angles Theorem.

EXERCISES

Use the given information and theorems and postulates you have learned to show that $c \parallel d$.



18. $m\angle 4 = 58°$, $m\angle 6 = 58°$

19. $m\angle 1 = (23x + 38)^{\circ}$, $m\angle 5 = (17x + 56)^{\circ}$, $x = 3$

20. $m\angle 6 = (12x + 6)^{\circ}$, $m\angle 3 = (21x + 9)^{\circ}$, $x = 5$

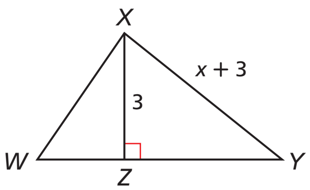
21. $m\angle 1 = 99°$, $m\angle 7 = (13x + 8)^{\circ}$, $x = 7$

3-4 Perpendicular Lines *(pp. 172–178)*

EXAMPLES

- **Name the shortest segment from point X to $\overline{WY}$.**

  $\overline{XZ}$



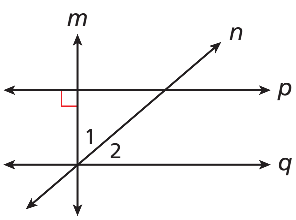
- **Write and solve an inequality for x.**

  $x + 3 > 3$

  $x > 0$ *Subtract 3 from both sides.*

- **Given: $m \perp p$, $\angle 1$ and $\angle 2$ are complementary.**

  Prove: $p \parallel q$

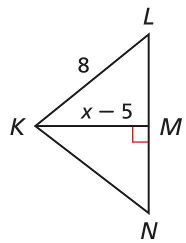


Proof:
It is given that $m \perp p$. $\angle 1$ and $\angle 2$ are complementary, so $m\angle 1 + m\angle 2 = 90°$. Thus $m \perp q$. Two lines perpendicular to the same line are parallel, so $p \parallel q$.

EXERCISES

22. Name the shortest segment from point K to $\overline{LN}$.

23. Write and solve an inequality for x.



24. **Given:** $\overline{AD} \parallel \overline{BC}$, $\overline{AD} \perp \overline{AB}$, $\overline{DC} \perp \overline{BC}$

Prove: $\overline{AB} \parallel \overline{CD}$