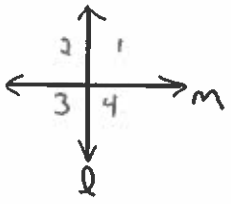
Perpendicular:

☆ Lines, rays, segments, or planes that intersect to form right (90 degrees) angles

" ⊥ "

Given $l \perp m$, what can you conclude?

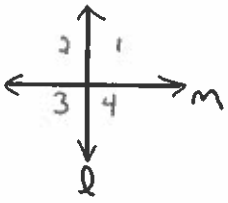


$\angle 1, \angle 2, \angle 3, \angle 4$ are Right $\angle$s [Def. of $\perp$]

$m\angle 1 = m\angle 2 = m\angle 3 = m\angle 4 = 90^\circ$ [Def of $\perp$]

$\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$ [Def. of $\cong$ $\angle$s]

Given $m\angle 1 = 90^\circ$, what can you conclude?



$Q \perp m$ [Def. of $\perp$]

$\angle 1, \angle 2, \angle 3, \angle 4$ are Right $\angle$s [Def. of $\perp$]

$m\angle 1 = m\angle 2 = m\angle 3 = m\angle 4 = 90^\circ$ [Def of $\perp$]

$\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$ [Def. of $\cong$ $\angle$s]

Right Angles Theorem:

If $\angle A$ and $\angle B$ are right angles, then they are congruent.

Given: $\angle A$ and $\angle B$ are Right $\angle$s

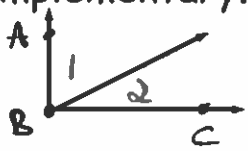
Prove: $\angle A \cong \angle B$

Statements	Reasons
1. $\angle A$ and $\angle B$ are Rt. $\angle$s	Given
2. $m\angle A = m\angle B = 90^\circ$	Def. of Right $\angle$
3. $\angle A \cong \angle B$	Def of $\cong$ $\angle$s

If the exterior sides of two adjacent acute angles are perpendicular, then the angles are complementary.

Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$

Prove: $\angle 1$ and $\angle 2$ are complementary $\angle$s



Statements	Reasons
1. $\overrightarrow{BA} \perp \overrightarrow{BC}$	Given
2. $m\angle ABC = 90°$	Def. of $\perp$
3. $m\angle 1 + m\angle 2 = m\angle ABC$	$\angle$ Add. Post.
4. $m\angle 1 + m\angle 2 = 90°$	Subst. Prop. of = (2 → 3)
5. $\angle 1$ and $\angle 2$ are Comp. $\angle$s	Def. of Comp. $\angle$s

Ext. sides $\perp$ → Comp. $\angle$s

If two lines are perpendicular, then they form congruent adjacent angles.

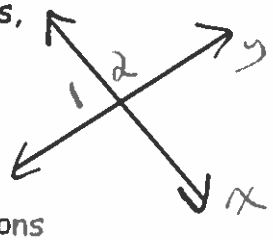
Given: $x \perp y$

Prove: $\angle 1 \cong \angle 2$

Statements	Reasons
1. $x \perp y$	Given
2. $\angle 1$ and $\angle 2$ are Rt. $\angle$s	Def. of $\perp$
3. $\angle 1 \cong \angle 2$	Right $\angle$s Thm.

$\perp$ lines → $\cong$ adj. $\angle$s

If two lines form congruent adjacent angles, then the lines are perpendicular.



Given: $\angle 1 \cong \angle 2$

Prove: $x \perp y$

Statements	Reasons
1. $\angle 1 \cong \angle 2$	Given
2. $m\angle 1 + m\angle 2 = 180^\circ$	Linear Pair Post.
3. $m\angle 1 = m\angle 2$	Def. of $\cong$ $\angle$s
4. $m\angle 1 + m\angle 1 = 180^\circ$	Subst. Prop. of = (3 → 2)
5. $2m\angle 1 = 180^\circ$	Dist. Prop.
6. $m\angle 1 = 90^\circ$	Div. Prop. of =
7. $x \perp y$	Def. of $\perp$

* $\cong$ adj $\angle$s → $\perp$ lines

Biconditional

$\perp$ lines $\leftrightarrow \cong$ adj. $\angle$s

Assignment #17

Part I: R&TN p. 56. Complete p. 57 CE #4-11.

Part II: p. 58-60 WE #1-8, 9-12(Reasons Required), 13, 14-25 (Reasons Required), 28