Unit 2 Learning Goal

GEO.B.11.IndDedReasoning
Use inductive and deductive reasoning to make conjectures both verbally, algebraically, and geometrically.

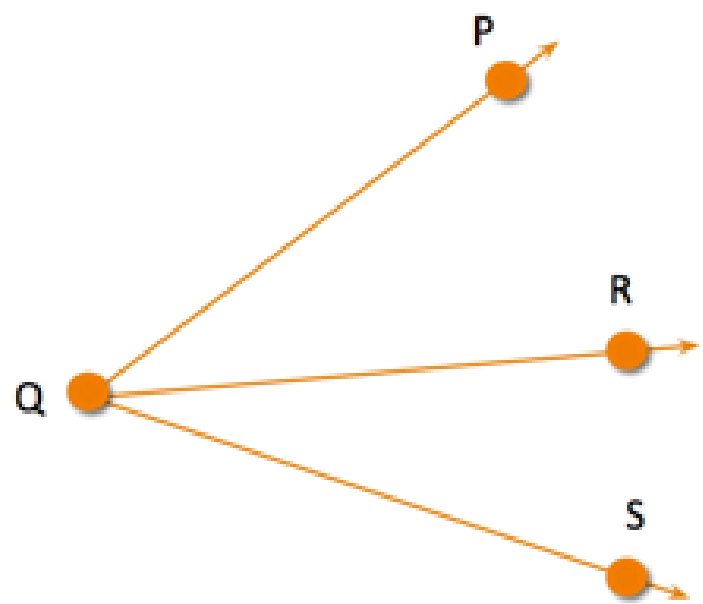
Lesson 2-6 Learning Target

- I can complete proofs involving angle theorems

Angle Addition Postulate

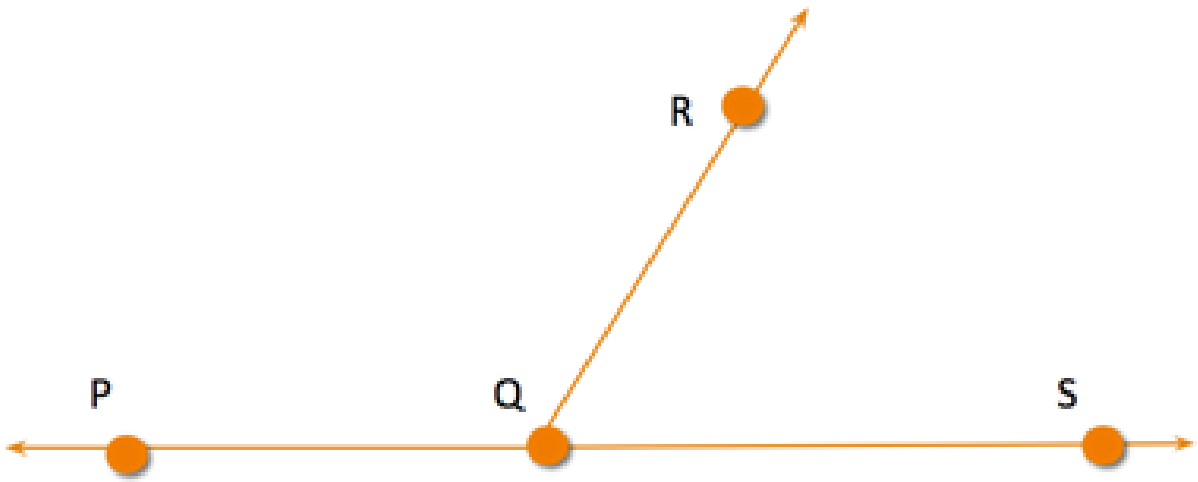
If R is in the interior of $\angle PQS$, then

$$m\angle PQR + m\angle RQS = m\angle PQS.$$



Supplement Theorem

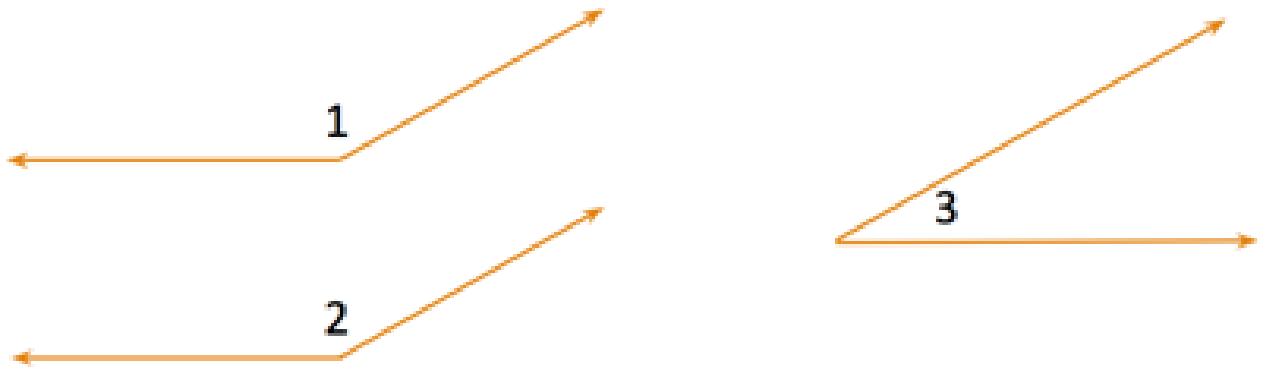
If two angles form a linear pair, then they are supplementary angles.



∠s supp. to same ∠ or ≅ ∠s are ≅

Angles supplementary to the same angle or to congruent angles are congruent.

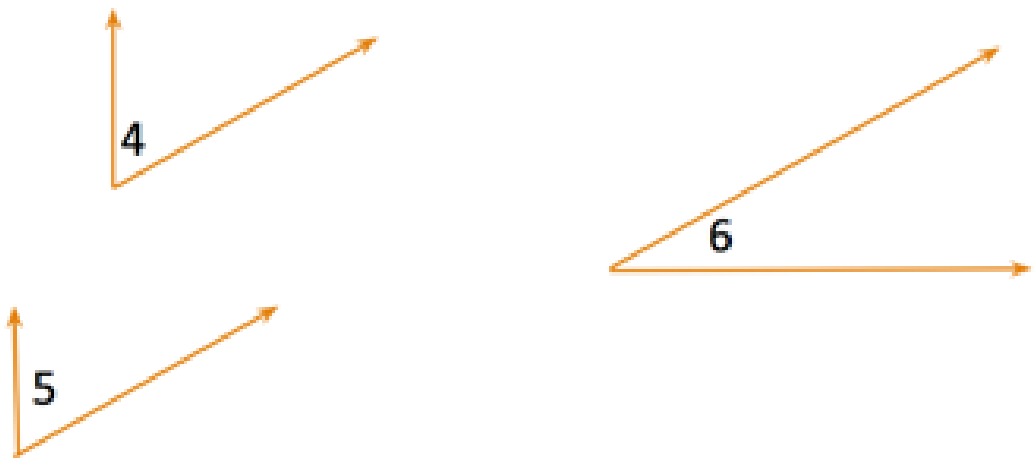
If ∠1 and ∠3 are supplementary and ∠2 and ∠3 are supplementary, then ∠1 ≅ ∠2.



∠s comp. to same ∠ or ≅ ∠s are ≅

Angles complementary to the same angle or to congruent angles are congruent.

If ∠4 and ∠6 are complementary and ∠5 and ∠6 are complementary, then ∠4 ≅ ∠5.

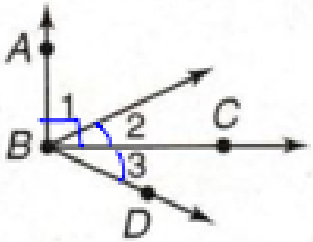


Complete the following proofs.

1. Given: $\overline{AB} \perp \overline{BC}$

$m\angle 2 = m\angle 3$

Prove: $m\angle 1 + m\angle 3 = 90$

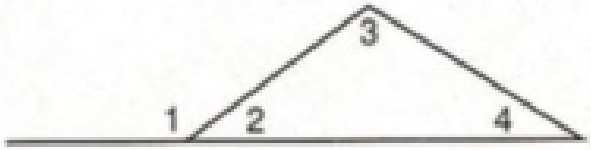


Proof:

Statements	Reasons
a. $\overline{AB} \perp \overline{BC}$ $m\angle 2 = m\angle 3$	**a.** Given
b. ABC is a right angle.	**b.** Def. of perp (⊥)
c. $m\angle ABC = 90$	**c.** Def. of rt∠
d. $m\angle ABC = m\angle 1 + m\angle 2$	**d.** ∠ add. post.
e. $m\angle 1 + m\angle 2 = 90$	**e.** Substitution
f. $m\angle 1 + m\angle 3 = 90$	**f.** Substitution

2. Given: $\angle 1$ and $\angle 2$ form a linear pair.
$m\angle 2 + m\angle 3 + m\angle 4 = 180$

Prove: $m\angle 1 = m\angle 3 + m\angle 4$



Proof:

Statements	Reasons
a. $\angle 1$ and $\angle 2$ form a linear pair. $m\angle 2 + m\angle 3 + m\angle 4 = 180$	**a.** Given
b. $\angle 1$ and $\angle 2$ are supplementary.	**b.** Def. of linear pair
c. $m\angle 1 + m\angle 2 = 180$	**c.** Def. of supp.
d. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	**d.** Substitution
e. $m\angle 1 = m\angle 3 + m\angle 4$	**e.** Subtraction prop. (=)

$\angle 1 + \angle 2 = \angle 2 + \angle 3 + \angle 4$