

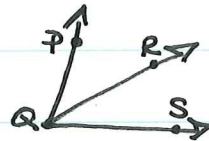
10/12/11 & 10/13/11

2-8 Angle Relationships

Protractor Postulate:

Given \overrightarrow{AB} and a $\# r$ is between 0 and 180, there is exactly one angle, $\angle ABR$, that can be measured with a protractor.

Angle Addition Postulate:

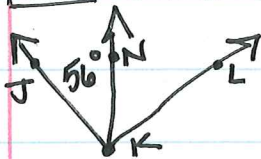


If R is in the interior of $\angle PQS$, then

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

If $m\angle PQR + m\angle RQS = m\angle PQS$, then R is in the interior of $\angle PQS$.

ex Find $m\angle NKL$ if $m\angle JKL = 2(m\angle JKN)$.



$$m\angle JKN + m\angle NKL = m\angle JKL$$

$$m\angle JKN + m\angle NKL = 2(56)$$

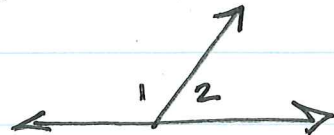
$$56 + m\angle NKL = 112$$

$$\begin{array}{r} -56 \\ \hline m\angle NKL = 56 \end{array}$$

$$m\angle NKL = 56$$

Supplement Theorem:

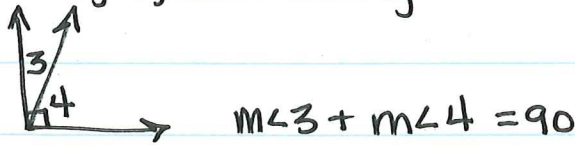
If two angles form a linear pair, then they are supplementary angles.



$$m\angle 1 + m\angle 2 = 180$$

Complement Theorem:

If the noncommon sides of two adjacent angles form a right angle, then the angles are complementary angles.



ex If $\angle 1$ and $\angle 2$ form a linear pair, and $m\angle 2 = 67$, then find $m\angle 1$.

$$m\angle 1 + m\angle 2 = 180 \quad \text{Suppl. thm.}$$

$$m\angle 1 + 67 = 180 \quad \text{Substitution}$$

$$\begin{array}{r} -67 \quad -67 \\ \hline \end{array} \quad \text{SPOE (subtraction)}$$

$$m\angle 1 = 113 \quad \text{Substitution}$$

ex If $\angle 3$ and $\angle 4$ form a right angle and $m\angle 3 = 2x$ and $m\angle 4 = 7x$, then find x and the measures of the angles.

$$m\angle 3 + m\angle 4 = 90 \quad m\angle 3 = 2(10) \quad m\angle 4 = 7(10)$$

$$2x + 7x = 90 \quad m\angle 3 = 20 \quad m\angle 4 = 70$$

$$\frac{9x}{9} = \frac{90}{9}$$

$$x = 10$$

Congruence of angles is:

reflexive: $\angle 1 \cong \angle 1$

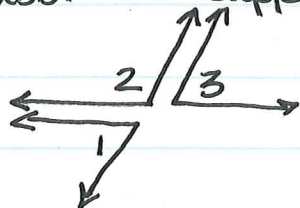
symmetric: If $\angle 2 \cong \angle 3$, then $\angle 3 \cong \angle 2$.

transitive: If $\angle 4 \cong \angle 5$ and $\angle 5 \cong \angle 6$, then $\angle 4 \cong \angle 6$.

Congruence Relationships

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

abbr: \angle s suppl. to same \angle are \cong .



If $m\angle 1 + m\angle 2 = 180$ and $m\angle 2 + m\angle 3 = 180$,
then $\angle 1 \cong \angle 3$.

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

abbr: \angle s compl. to same \angle are \cong .

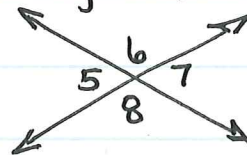


If $m\angle 1 + m\angle 2 = 90$ and $m\angle 2 + m\angle 3 = 90$,
then $\angle 1 \cong \angle 3$.

Vertical Angles Theorem:

If two angles are vertical angles, then they are congruent.

abbr: Vert. \angle s are \cong .



$\angle 5 \cong \angle 7$

$\angle 6 \cong \angle 8$

Right Angles Theorems:

- Perpendicular lines intersect to form right angles.
- All right angles are congruent
- Perpendicular lines form congruent adjacent angles.
- If two angles are congruent and supplementary, then each angle is a right angle.
- If two congruent angles form a linear pair, then they are right angles.