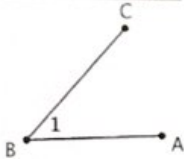


Objective:

- Students will know how to use and be able to prove the vertical angle theorem.

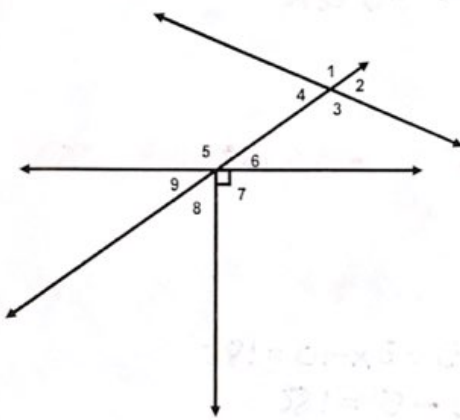
Naming an Angle:



How many different ways can you name this angle?

$\angle 1, \angle B, \angle ABC, \angle CBA$

Vocabulary: Different Kinds of Angles



Adjacent Angles: Angles "next to" each other.
Examples: $\angle 1$ and $\angle 2, \angle 1$ and $\angle 4, \angle 6$ and $\angle 7$
Linear Pairs: A pair of angles that form a line. 180°
Examples: $\angle 1$ and $\angle 2, \angle 5$ and $\angle 6$
Vertical Angles: Opposite angles made by two intersecting lines that are congruent (EQUAL).
Examples: $\angle 1$ and $\angle 3, \angle 2$ and $\angle 4, \angle 9$ and $\angle 6$
Supplementary Angles: Angles that add up to 180°
Examples: $\angle 1$ and $\angle 2, \angle 5$ and $\angle 6, \angle 2$ and $\angle 3$
Complementary Angles: Angles that add up to 90°
Examples: $\angle 9$ and $\angle 8$

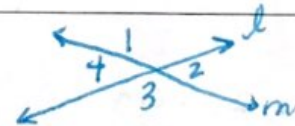
same

Right Angles: 90° Angles
Examples: $\angle 7$

Example #1: Prove the Vertical Angle Theorem

Given: Lines l and m intersect to form vertical angles $\angle 1$ and $\angle 3$.

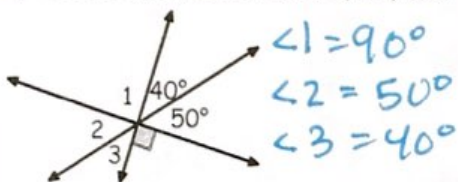
Prove: Vertical Angles Theorem: $m\angle 1 \cong m\angle 3$



Statement	Reason
1) l and m intersect to form vertical angles $\angle 1$ and $\angle 3$	1) Given
2) $\angle 1 + \angle 2 = 180^\circ$	2) Linear Pair
3) $\angle 2 + \angle 3 = 180^\circ$	3) Linear Pair
4) $\angle 1 + \angle 2 = \angle 2 + \angle 3$	4) Substitution
5) $\angle 1 \cong \angle 3$	5) Subtraction

Practice Set:

1) What are the measures of $\angle 1$, $\angle 2$, $\angle 3$?



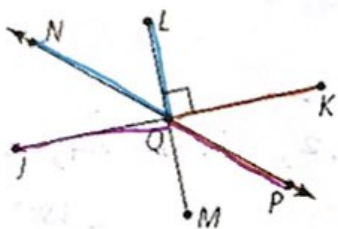
2) If $m\angle B = 37^\circ$, find the measure of its complement.

$$90 - 37 = \boxed{53^\circ}$$

3) If $m\angle B = 87^\circ$, find the measure of its supplement.

$$180 - 87 = \boxed{93^\circ}$$

4)



a) Name an angle adjacent to $\angle KQP$

$\angle PQM$ and $\angle LQK$

b) Name an angle supplementary to $\angle PQJ$

$\angle PQL$ and $\angle JQN$

c) Name an angle complementary to $\angle LQN$

$\angle NQJ$

d) List a pair of vertical angles.

$\angle KQP$ and $\angle NQJ$ $\angle LQK$ and $\angle JQM$

e) Name two angles that form a linear pair.

5) $\angle A$ and $\angle B$ are complementary. Find $m\angle A$ and $m\angle B$ if $m\angle A = 3x - 5$ and $m\angle B = x + 15$.

$$3x - 5 + x + 15 = 90$$

$$4x + 10 = 90$$

$$\frac{4x}{4} = \frac{80}{4}$$

$$x = 20$$

$\angle A = 55^\circ$
 $\angle B = 35^\circ$

6) $\angle A$ and $\angle B$ are supplementary. Find $m\angle A$ and $m\angle B$ if $m\angle A = 2x + 5$ and $m\angle B = 3x - 10$.

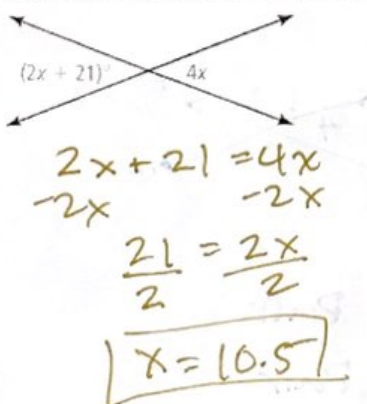
$$2x + 5 + 3x - 10 = 180$$

$$5x - 5 = 180$$

$$\frac{5x}{5} = \frac{185}{5}$$

$$x = 37$$

7) Write an equation and solve for x.



8) Solve for x and y.

