

TOPIC: 2.7 Prove Angle Pair Relationships

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DATE:

ESSENTIAL QUESTION: What is the relationship between vertical angles, between two angles that are supplementary to the same angle and between two angles that are complementary to the same angle?

QUESTIONS:

What is the difference btw. Comp. & supp.?

Use the theorems and/or postulates to prove a statement

REVIEW VOCABULARY:

Complementary

2 angles sum = 90°

Supplementary

2 angles sum = 180°

Vertical angles.

- Form 2 pairs of opposite rays
- congruent

$m\angle 1 = m\angle 2$



Theorem 2.3: Right Angles Congruence Theorem

All right angles are congruent.

Theorem 2.4: Congruent Supplements Theorem

If $\angle 1$ and $\angle 2$ are supplementary and $\angle 2$ and $\angle 3$ are supplementary, then $\angle 1 \cong \angle 3$.

Theorem 2.5: Congruent Complements Theorem

If $\angle 1$ and $\angle 2$ are complementary and $\angle 2$ and $\angle 3$ are complementary, then $\angle 1 \cong \angle 3$.

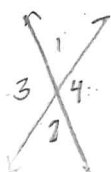
Postulate 12: Linear Pair Postulate

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

Theorem 2.6: Vertical Angles Congruence Theorem

If $\angle 1$ and $\angle 2$ are vertical angles, then $\angle 1 \cong \angle 2$.

SUMMARY:



→ Vertical \angle 's are \cong

→ $\angle 1$ & $\angle 4$ are supp. & $\angle 2$ & $\angle 3$ are supp.
then $\angle 1 \cong \angle 2$

→ if $\angle A$ & $\angle B$ are comp & $\angle C$ & $\angle B$ are comp
then $\angle A \cong \angle C$

QUESTIONS:

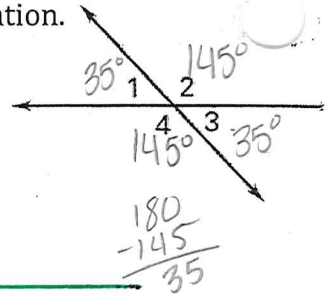
Give one \angle measure find the others

A1. If $m\angle 4 = 145^\circ$ in the figure to the right, then give the measures of the other three angles using proper notation.

$$m\angle 1 = 35^\circ$$

$$m\angle 2 = 145^\circ$$

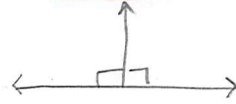
$$m\angle 3 = 35^\circ$$



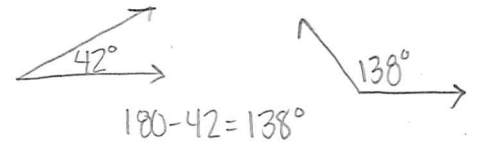
Sketch the figure being described

A2. Make a sketch of the given information. Label all angles which can be determined.

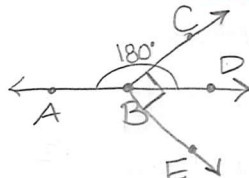
a. Congruent angles forming linear pair.



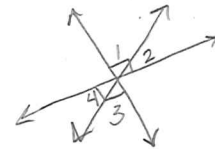
b. Non-adjacent supplementary with one angle measures 42° .



c. $\angle ABC$ and $\angle CBD$ are a linear pair and $\angle CBD$ and $\angle DBE$ are adjacent complementary angles



d. $\angle 1$ and $\angle 3$ are vertical angles. $\angle 3$ and $\angle 4$ as well as $\angle 1$ and $\angle 2$ are complementary.



Find the value of the variable by setting up an algebraic equation

A3. Find the values of the variables in each figure.

$$7x = 5x + 18$$

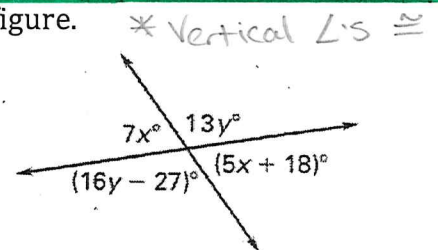
$$13y = 16y - 27$$

$$2x = 18$$

$$-3y = -27$$

$$x = 9$$

$$y = 9$$



A4. Prove that if $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 4$.

1. $\angle 2 \cong \angle 3$

1. Given

2. $\angle 1 \cong \angle 2$

2. Vertical \angle

3. $\angle 3 \cong \angle 4$

3. Vertical \angle

4. $\angle 1 \cong \angle 3$

4. Transitive

5. $\angle 2 \cong \angle 4$

5. Transitive

6. $\angle 1 \cong \angle 4$

6. Transitive

