

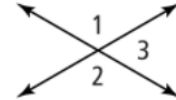
Write a Two-Column Proof

🔊 A theorem is a conjecture that is proven.
 Prove the Vertical Angles Theorem.

Given: $\angle 1$ and $\angle 2$ are vertical angles.

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

COMMON ERROR



$$4 + 1 = 5$$

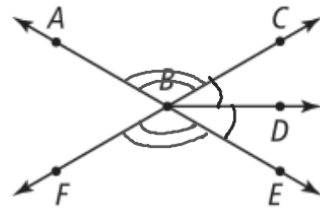
$$3 + 2 = 5$$

$$4 + 1 = 3 + 2$$

Statement	Reason
1) $\angle 1$ and $\angle 2$ are vertical \angle 's	1) Given
2) $\angle 1$ and $\angle 3$ form Linear Pair	2) Def of Linear Pair
3) $m\angle 1 + m\angle 3 = 180$	3) Linear Pair Post.
4) $\angle 2$ and $\angle 3$ form Linear Pair	4) Def of Linear Pair
5) $m\angle 2 + m\angle 3 = 180$	5) Linear Pair Post.
6) $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3$ $\quad \quad \quad -m\angle 3 \quad \quad \quad -m\angle 3$	6) Sub prop.
7) $m\angle 1 = m\angle 2$	7) Subtr prop.
8) $\angle 1 \cong \angle 2$	8) Def of $\cong \angle$'s.

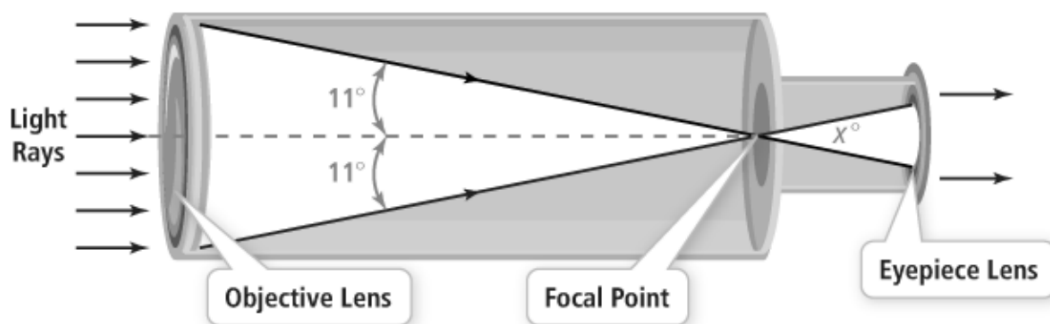
1. Write a two-column proof.

Given: \overrightarrow{BD} bisects $\angle CBE$.
 Prove: $\angle ABD \cong \angle FBD$



Statement	Reason
1) \overrightarrow{BD} bisects $\angle CBE$	1) Given
2) $\angle CBD \cong \angle EBD$	2) Def of Bisector
3) $m\angle CBD = m\angle EBD$	3) Def \cong \angle 's.
4) $\angle ABC \cong \angle FBE$	4) Vert \angle 's \cong .
5) $m\angle ABC = m\angle FBE$	5) Def \cong \angle 's
6) $m\angle ABD = m\angle ABC + m\angle CBD$ $m\angle FBD = m\angle FBE + m\angle EBD$	6) Angle Add Post.
7) $m\angle ABD = m\angle FBD$	7) Sub Prop
8) $\angle ABD \cong \angle FBD$	8) Def \cong \angle 's.

The diagram shows how glass lenses change the direction of light rays passing through a telescope. What is the value of x , the angle formed by the crossed outermost light rays through the focal point?

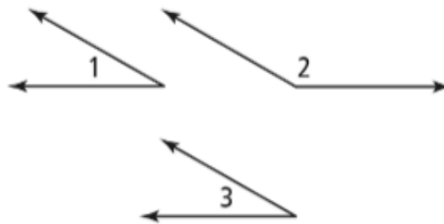


Congruent Supplements Theorem

If two angles are supplementary to congruent angles (or to the same angle), then they are congruent.

PROOF: SEE EXAMPLE 3.

If... $m\angle 1 + m\angle 2 = 180^\circ$ and
 $m\angle 3 + m\angle 2 = 180^\circ$



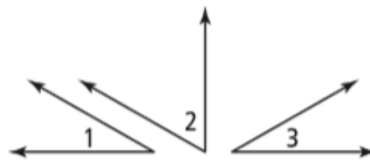
Then... $\angle 1 \cong \angle 3$

Congruent Complements Theorem

If two angles are complementary to congruent angles (or to the same angle), then they are congruent.

PROOF: SEE EXAMPLE 3 TRY IT.

If... $m\angle 1 + m\angle 2 = 90^\circ$ and
 $m\angle 3 + m\angle 2 = 90^\circ$



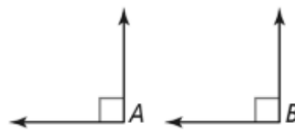
Then... $\angle 1 \cong \angle 3$

THEOREM 1-4

All right angles are congruent.

PROOF: SEE EXERCISE 9.

If...



Then... $\angle A \cong \angle B$

THEOREM 1-5

If two angles are congruent and supplementary, then each is a right angle.

PROOF: SEE EXERCISE 11.

If... $\angle 1 \cong \angle 2$ and $m\angle 1 + m\angle 2 = 180^\circ$

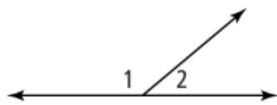


Then... $\angle 1$ and $\angle 2$ are right angles

Linear Pair Posulate

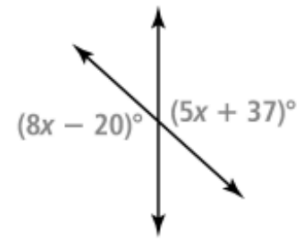
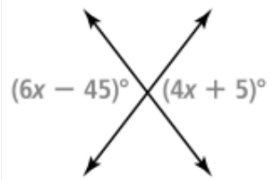
The sum of the measures of a linear pair is 180.

If... $\angle 1$ and $\angle 2$ form a linear pair.

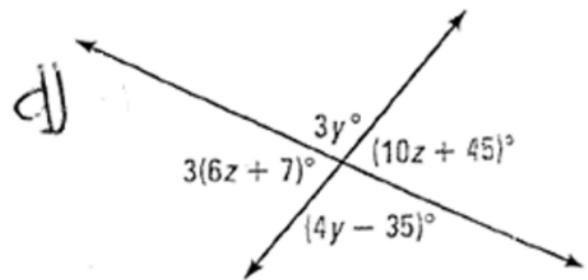
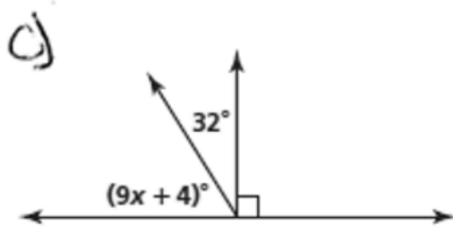
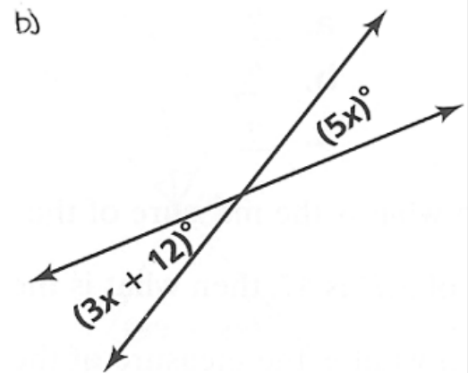
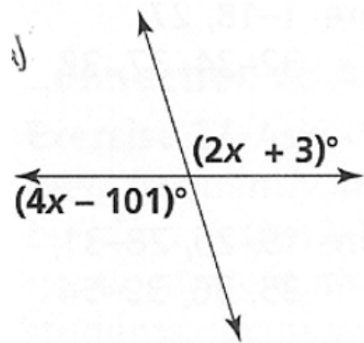


Then... $m\angle 1 + m\angle 2 = 180$.

2. a. Find the value of x and the measure of each labeled angle.

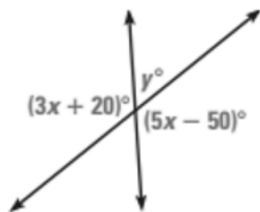


Find the value of the variable.

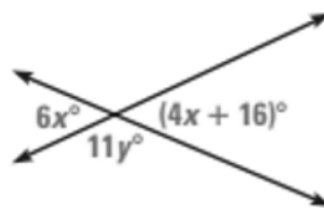


3. Solve for the variable using what you know about angle relationships. *Show Work.*

a.



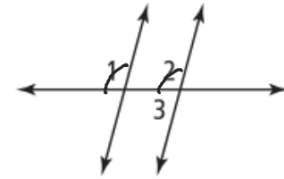
b.



Write a two-column proof.

Given: $m\angle 1 = m\angle 2$, $m\angle 1 = 105$

Prove: $m\angle 3 = 75$



Statement	Reason
1) $m\angle 1 = m\angle 2$ $m\angle 1 = 105$	1) Given
2) $\angle 2$ & $\angle 3$ form Linear Pair	2) Def of Linear Pair
3) $m\angle 2 + m\angle 3 = 180^\circ$	3) Linear Pair Post.
4) $m\angle 2 = 105$	4) Sub prop
5) $105 + m\angle 3 = 180$	5) Sub prop
6) $m\angle 3 = 75$	6) Subst prop.

Given: $\overline{LK} \cong \overline{NM}$, $\overline{KJ} \cong \overline{MJ}$

Prove: $\overline{LJ} \cong \overline{NJ}$

Proof:

