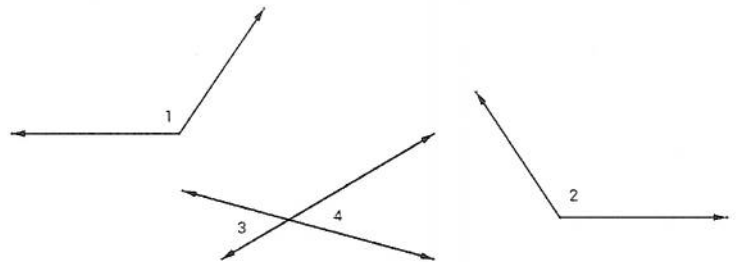


Activity 1: Mystery Proof

Get a proof envelope from the front of the class. In it you will find the statements and reasons needed to complete the following proof, but all of the statements and reasons have been mixed up. Put them in the correct order, and in the correct columns, in order to complete the proof.

Given: $\angle 1$ is supplementary to $\angle 3$.
 $\angle 2$ is supplementary to $\angle 4$.
Prove: $\angle 1 \cong \angle 2$.

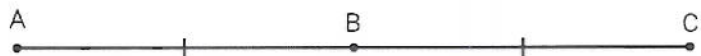


Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 3$	1. Given
2. $m\angle 1 + m\angle 3 = 180^\circ$	2. Defn. of supp. angles
3. $\angle 2$ is supplementary to $\angle 4$	3. Given
4. $m\angle 2 + m\angle 4 = 180^\circ$	4. Defn. of supp. angles
5. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$	5. Transitive Prop. of Equality
6. $\angle 3$ & $\angle 4$ are vertical angles	6. Given by the diagram
7. $m\angle 3 = m\angle 4$	7. Defn. of vert. angles
8. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3$	8. Substitution Property
9. $m\angle 1 = m\angle 2$	9. Subtraction Property
10. $\angle 1 \cong \angle 2$	10. Defn. of Congruent angles

Activity 2: Fill in the Reasons

Complete the proof by providing a reason for each statement.

Given: B is the midpoint of \overline{AC} .
Prove: $AB = \frac{AC}{2}$.



Statements	Reasons
1. B is the midpoint of \overline{AC} .	1. Given
2. $AB = BC$	2. Definition of a midpoint
3. $AB + BC = AC$	3. Segment addition postulate
4. $AB + AB = AC$	4. Substitution Property
5. $2AB = AC$	5. Simplifying the LHS
6. $AB = \frac{AC}{2}$	6. Division Property

Activity 3: Fill in the Blank Proof

In the following proofs, some statements and some reasons have been given. Complete the proofs by filling in the blank statements and reasons.

Given: $\overline{FL} \cong \overline{AT}$

Prove: $\overline{FA} \cong \overline{LT}$

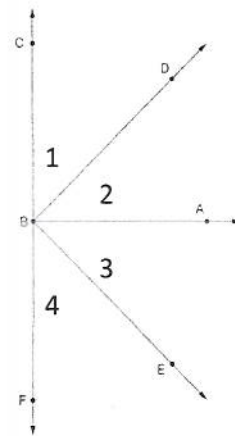


Statements	Reasons
1. $\overline{FL} \cong \overline{AT}$	1. Given
2. $FL = AT$	2. Defn of congruent segments
3. $\overline{LA} \cong \overline{LA}$	3. Reflexive Property
4. $LA = LA$	4. Definition of congruent segments
5. $FL + LA = AT + LA$	5. Addition Property of equality
6. $FA = FL + LA$ $LT = LA + AT$	6. Segment Addition Property
7. $FA = LT$	7. Substitution
8. $\overline{FA} \cong \overline{LT}$	8. Definition of congruent segments

Given: $\overline{BA} \perp \overline{CF}$

\overline{BA} bisects $\angle DBE$

Prove: $\angle 1 \cong \angle 4$



Statements	Reasons
1. $\overline{BA} \perp \overline{CF}$	1. Given
2. $m\angle ABC = m\angle ABF = 90^\circ$	2. Defn of perpendicular lines
3. \overline{BA} bisects $\angle DBE$	3. Given
4. $\angle 2 \cong \angle 3$	4. Definition of angle bisector
5. $m\angle 2 = m\angle 3$	5. Definition of congruent angles
6. $m\angle 1 + m\angle 2 = m\angle ABC$ $m\angle 3 + m\angle 4 = m\angle ABF$	6. Angle Addition Property
7. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	7. Transitive Property of Equality
8. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 4$	8. Substitution Property
9. $m\angle 1 = m\angle 4$	9. Subtraction Property
10. $\angle 1 \cong \angle 4$	10. Defn of congruent \angle 's.

Activity 4: Find the Error

The statements below “prove” that $1 = 2$. Describe the error.

Given: Some real number $a = b$.

Prove: $1 = 2$

Statements	Reasons
1. $a = b$	1. Given
2. $ab = b^2$	2. Multiplication Property of Equality
3. $ab - a^2 = b^2 - a^2$	3. Subtraction Property of Equality
4. $a(b - a) = (b + a)(b - a)$	4. Distributive Property
5. $a = b + a$	5. Division Property of Equality
6. $a = a + a$	6. Substitution Property of Equality
7. $a = 2a$	7. Simplify
8. $1 = 2$	8. Division Property of Equality

~~1000~~ The error was made between steps 4 & 5.

Both sides of the equation were divided by $(b-a)$, but because $b=a$ (Given), we know $b-a=0$.

The Division Property of Equality does not apply to division by zero.

(In fact, division by zero is **ILLEGAL** in math class.)