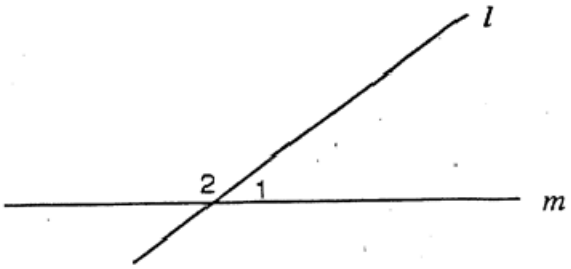
3.17

Geometry Proofs

1. Supplementary Angles Theorem

Given: l and m intersect
Prove: $\angle 1$ and $\angle 2$ are supplementary

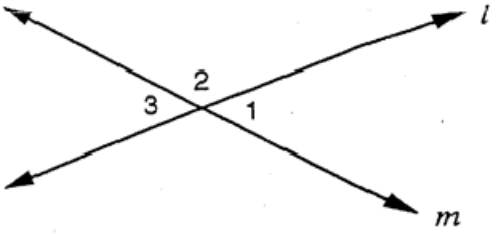


STATEMENTS	REASONS
1. l and m intersect	1.
2. $m\angle 1 + m\angle 2 = 180°$	2.
3. $\angle 1$ and $\angle 2$ are supplementary	3.

Write the conclusion of this theorem as an implication.

2. Vertical Angles Theorem

Given: l and m intersect
Prove: $m\angle 1 = m\angle 3$



STATEMENTS	REASONS
1. l and m intersect	1.
2. $m\angle 1 + m\angle 2 = 180°$	2.
3. $m\angle 2 + m\angle 3 = 180°$	3.
4. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	4.
5. $m\angle 1 = m\angle 3$	5.

Write the conclusion of this theorem as an implication.

Geometry Proofs

3. Prove that all right angles are equal

Given: $\angle 1$ is a right angle
$\angle 2$ is a right angle

Prove: $m\angle 1 = m\angle 2$

STATEMENTS	REASONS
1. $\angle 1$ is a right angle $\angle 2$ is a right angle	1.
2. $m\angle 1 = 90°$	2.
3.	3. Definition of a right angle
4. $m\angle 1 = m\angle 2$	4.

4. Prove that if two angles are both equal and supplementary, then they are right angles.

Given: $m\angle 1 = m\angle 2$, and they are supplementary

Prove: $\angle 1$ and $\angle 2$ are right angles

STATEMENTS	REASONS
1. $m\angle 1 = m\angle 2$	1.
2. $\angle 1$ and $\angle 2$ are supplementary	2.
3.	3. Definition of supplementary angles
4. $m\angle 1 + (m\angle 1) = 180°$	4.
5. $2(m\angle 1) = 180°$	5. Substitution
6.	6. Division Property
7. $m\angle 2 = 90°$	7.
8. $\angle 1$ and $\angle 2$ are right angles	8.