

KEY

Chapter 2 - Geometry Review

2.2 Conditional Statements

1. Give a counterexample to show that the following conjecture is false: "If $\angle 1$ and $\angle 2$ are complementary, then the angles are not congruent."

False; $m\angle 1 = 45$ and $m\angle 2 = 45$,
↑
 counterexample

2. Give a counterexample to show that the following conjecture is false: "If $\angle 1$ and $\angle 2$ are congruent, then they are both obtuse angles."

False; $m\angle 1 = 75^\circ$ and $m\angle 2 = 75^\circ$,
↑
 counterexample

3. Determine if the following are true. If false, give a counterexample.

a. If $9x - 11 = 2x + 3$, then $x = 2$.

$$18 - 11 = 4 + 3$$

$$7 = 7 \checkmark$$

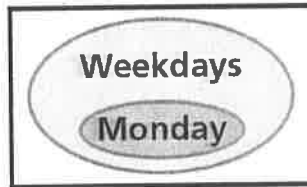
True

b. If an angle is acute, then it has a measure of 30° .

False, 45°

4. Write a conditional statement from the Venn Diagram.

If today is Monday, then it is a week day.



5. Write the converse, inverse, and contrapositive. Determine which one will always be true.

"If you live in Oklahoma, then you live in the United States."

F Converse: If you live in U.S., then you live in Oklahoma.

F Inverse: If you don't live in Oklahoma, you don't live in U.S.

T Contrapositive: If you don't live in U.S., then you don't live in Oklahoma.

6. Use the true statements below to determine whether each conclusion is true or false.

"Sue is a member of the swim team. When the team practices, Sue swims. The team begins practice when the pool opens. The pool opens at 8 AM on weekdays and at noon on Saturdays."

- a. The swim team practices on weekdays only. F
- b. Sue swims on Saturdays. T
- c. Swim team practice starts at the same time every day. F

7. Which conclusion is valid for the situation below?

If two angles are complementary, then the sum of their measures is 90° .

$\angle A$ and $\angle B$ are complementary.

- a. $m\angle A = 90^\circ$
- b. $m\angle A = 90^\circ + m\angle B$
- c. $m\angle A = 90^\circ - m\angle B$
- d. $\angle A$ is a right angle.

$$m\angle A + m\angle B = 90,$$

so

$$m\angle A = 90 - m\angle B$$

2.4 Bi-conditional Statements

8. Write the following statements as bi-conditional statements.

- a. The measure of a right angle is 90° .

An angle is a right angle if and only if the measure is 90° ,
(iff)

- b. If this month is September, then next month is October.

The month is September if and only if next month is October,
(iff)

2.5 Algebraic Proof

9. Solve each equation. Write a justification for each step.

$$\text{a. } \frac{m}{-5} + 3 = -4.5$$

$$\frac{m}{-5} = -7.5$$

$$m = 37.5$$

Given

Subtraction POE

Simplify

Multiplication POE

$$\text{b. } -47 = 3x - 59$$

$$+59 \quad +59$$

$$\frac{12}{3} = \frac{3x}{3}$$

$$4 = x$$

Given

Addition POE

Simplify

Division POE

Simplify

10. Identify the property that justifies each statement.

L a. $25 = 25$

B b. If $\angle RST \cong \angle ABC$, then $\angle ABC \cong \angle RST$

I c. $2x = 9$, and $y = 9$, so $2x = y$.

C d. $\angle XYZ \cong \angle XYZ$

G e. If $x = y$, then $x + 5 = y + 5$

E f. If $x = y$, then $2x = 2y$.

H g. $3(x + y) = 3x + 3y$

K h. If $x = y$, then $y = x$.

D i. If $x = y$, then $\frac{x}{w} = \frac{y}{w}$.

F j. If $x = y$, then $x - 7 = y - 7$

A. Transitive Property of Congruence

B. Symmetric Property of Congruence

C. Reflexive Property of Congruence

D. Division Property of Equality

E. Mult. Property of Equality

F. Subtraction Property of Equality

G. Addition Property of Equality

H. Distributive Property

I. Substitution Property of Equality

J. Transitive Property of Equality

K. Symmetric Property of Equality

L. Reflexive Property of Equality

2.6 Geometric Proof

11. Write a justification for each step. Given: $\angle 1$ and $\angle 2$ complementary and $\angle 1 \cong \angle 3$.

$\angle 1$ and $\angle 2$ complementary

$$m\angle 1 + m\angle 2 = 90^\circ$$

$\angle 1 \cong \angle 3$

$$m\angle 1 = m\angle 3$$

$$m\angle 3 + m\angle 2 = 90^\circ$$

$\angle 3$ and $\angle 2$ complementary

Given

Def. of comp.

Given

Def. of \cong

Substitution

Def. of complementary

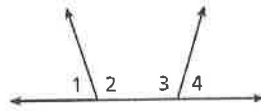
12.

Fill in the blanks to complete the two-column proof.

Given: $m\angle 1 + m\angle 3 = 180^\circ$

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

Proof: $m\angle 1 + m\angle 3 = 180$



$\angle 3 + \angle 4$ supplementary

$$m\angle 3 + m\angle 4 = 180$$

$$m\angle 1 + m\angle 3 = m\angle 3 + m\angle 4$$

$$-m\angle 3 \quad -m\angle 3$$

$$m\angle 1 = m\angle 4$$

$$\angle 1 \cong \angle 4$$

Given

Linear Pair Thm

Def. of supp.

Substitution

Subtraction Prop

Simplify

Def. of \cong

13. Given: $\angle AFB \cong \angle EFD$

Prove: \overrightarrow{FB} bisects $\angle AFC$.

$$\angle AFB \cong \angle EFD$$

$$\angle BFC \cong \angle EFD$$

$$\angle AFB \cong \angle BFC$$

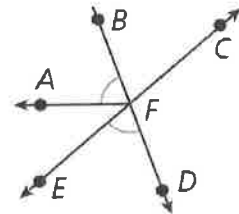
\overrightarrow{FB} bisects $\angle AFC$

Given

Vertical \angle 's Thm

Substitution

Def. of Bisector



14. Given: $\angle 1$ and $\angle 2$ are straight angles.

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

Proof:

$\angle 1 + \angle 2$ straight \angle 's

$$m\angle 1 = 180, m\angle 2 = 180$$

$$m\angle 1 = m\angle 2$$

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



Given

Def. of straight \angle 's

substitution

Def. of \cong