

KEY

Name: _____ Date: _____ Block: _____

Chapter 2 - Geometry Review

2.1 - Using Inductive Reasoning

1. What is the next item in each pattern?

a. 1, -3, 9, -27,

81

b. 2, 5, 9, 14, 20, ...
+3 +4 +5 +6 +7

27

2. Which equation models the number of dots in the n th term?

n	1	2	3	4	n = term
a_n	7	10	13	16	a_n = # dots in term

a. $a_n = 7x + 1$

b. $a_n = 4x + 3$

c. $a_n = 3x + 4$

d. $a_n = x + 7$

2.2 Conditional Statements

3. 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; if $m\angle 1 = 45^\circ$ and $m\angle 2 = 45^\circ$

4. 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; if $m\angle 1 = 30^\circ$ and $m\angle 2 = 30^\circ$
(could have several answers as long as both angles are the same and between 1° and 90°)

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

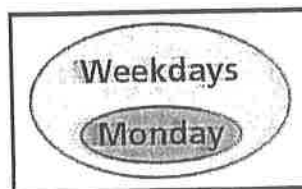
a. If $9x - 11 = 2x + 3$, then $x = 2$.

$$\begin{array}{r} -2x \quad -2x \\ \hline 7x - 11 = 3 \quad \text{TRUE} \\ +11 \quad +11 \\ \hline 7x = 14 \quad x=2 \\ \hline 7 \quad 7 \end{array}$$

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

False, could be 40° (or anything between 1 and 89 , but not 30)

6. Write a conditional statement from the Venn Diagram.



If today is Monday, then it is a weekday.

7. 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 the US, then you live in OK.

F Inverse: If you don't live in OK, then you don't live in US.

T Contrapositive: If you don't live in US, then you don't live in OK.

2.3 Using Deductive Reasoning

8. 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

9. 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.

2.4 Bi-conditional Statements

10. Write the following statements as bi-conditional statements. * iff = if and only if

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

An angle is a right angle iff the measure is 90° .

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

This month is September iff next month is October

2.5 Algebraic Proof

11. Solve each problem for the missing variable. Write a justification for each step.

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

$$\frac{m}{-5} + 3 = -4.5 \quad \text{Given}$$

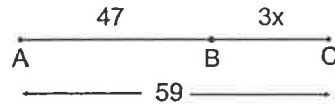
$$\begin{array}{r} -3 \\ -3 \end{array} \quad \text{Subtraction POE}$$

$$\frac{m}{-5} = -7.5 \quad \text{Simplify}$$

$$\begin{array}{r} -5 \\ -5 \end{array} \quad \text{Multiplication POE}$$

$$m = 37.5 \quad \text{Simplify}$$

b.



$$AB + BC = AC$$

$$47 + 3x = 59$$

$$\begin{array}{r} -47 \\ -47 \end{array}$$

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

$$x = 4$$

Segment Addn. Postulate
Substitution
Subtraction POE
Simplify
Division POE
Simplify

12. Identify the property that justifies each statement.

L a. $25 = 25$

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

J or 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 $x - 7 = y - 7$

K. Symmetric Property of Equality \longrightarrow

L. Reflexive Property of Equality \longrightarrow

- 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
- ~~X~~ Subtraction Property of Equality
- G. Addition Property of Equality
- H. Distributive Property
- I. Substitution Property of Equality
- J. Transitive Property of Equality

2.6 Geometric Proof

13. 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 complementary

Given

Def. of \cong

Substitution

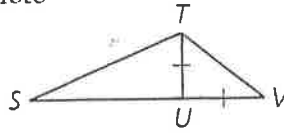
Def. of complementary

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

Given: $\overline{TU} \cong \overline{UV}$

Prove: $SU + TU = SV$

Two-column proof:



Statements	Reasons
1. $\overline{TU} \cong \overline{UV}$	1. a. ?
2. b. ?	2. Def. of \cong segs.
3. c. ?	3. Seg. Add. Post.
4. $SU + TU = SV$	4. d. ?

a. Given

b. $TU = UV$

c. $SU + UV = SV$

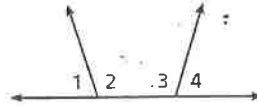
d. substitution

15. 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:



Statements	Reasons
1. $m\angle 1 + m\angle 3 = 180^\circ$	1. a. ?
2. b. ?	2. Def. of supp. \angle
3. $\angle 3$ and $\angle 4$ are supplementary.	3. Lin. Pair Thm.
4. $\angle 3 \cong \angle 4$	4. c. ?
5. d. ?	5. \cong Supps. Thm.

a. Given

b. $\angle 1 + \angle 3$ are supp. \angle 's

c. Reflexive POC

d. $\angle 1 \cong \angle 4$

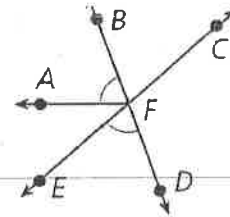
16. Given: $\angle AFB \cong \angle EFD$

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

Plan: Since vertical angles are congruent, $\angle EFD \cong \angle BFC$.

Use the Transitive Property to conclude that $\angle AFB \cong \angle BFC$.

Thus \overrightarrow{FB} bisects $\angle AFC$ by the definition of angle bisector.



Statements	Reasons
$\angle AFB \cong \angle EFD$	Given
$\angle EFD \cong \angle BFC$	Vertical Angles Thm
$\angle AFB \cong \angle BFC$	Transitive POC
\overrightarrow{FB} bisects $\angle AFC$	Def. of \angle Bisector

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

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

Proof:



Statements	Reasons
1. a. $\angle 1 + \angle 2$ straight \angle 's	1. Given
2. $m\angle 1 = 180^\circ, m\angle 2 = 180^\circ$	2. b. Def. of straight \angle
3. $m\angle 1 = m\angle 2$	3. Subst. Prop. of =
4. c. $\angle 1 \cong \angle 2$	4. Def. of $\cong \angle$