Name: Answer Key Date: Hour:

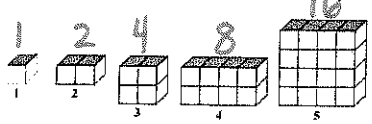
Chapter 2 Geometry Review

Section 2.1: Inductive Reasoning
I can define and identify inductive reasoning.
I can find and describe patterns in data.

Problems 2.1:
Find the patterns in the numbers, list the next 3 numbers in the series. Write a sentence to describe the pattern.

1. 1, 2, 4, 8, ... 16, 32, 64 double
2. 7, 9, 11, 13, ... 15, 17, 19 add 2
3. 7, 11, 15, 19, ... 23, 27, 31 add 4

4. What is the next step? What is the 43rd step?



2^{n-1}

$2^{43-1} = 4,398,046,511 \times 10^{12}$

The following statements are false. Give a counterexample which shows this:

5. If the product of two numbers is positive, then the two numbers must both be positive.

$-1 \cdot -1 = 1$

6. All prime numbers are odd.

2

7. If the product of two numbers is even, then the two numbers must both be even.

$7 \cdot 8 = 56$

Section 2.3: Deductive Reasoning
I can compare and contrast inductive and deductive reasoning.
I can use laws of logic to create new conditional statements or make valid conclusions.

Problems 2.3:

8. Rewrite the following statement as a hypothesis and conclusion.
Ants are insects.

If it's an ant, then it's an insect.

9. Compare and contrast inductive and deductive reasoning.

"gut", patterns, observations — facts, evidence, proofs

For the given true statement, make a valid conclusion:

10. If we don't make any stops, then we'll make it to the stadium by 12:30pm. If we make it to the stadium by that time, then we will see the kickoff. We did not make any stops.

We saw the kickoff

Decide if the argument is valid or invalid. Explain your reasoning.

11. Katie knows that all sophomores take drivers education in her school. Brandon takes drivers education; therefore, Brandon is a sophomore.

Not valid. He may be a freshman, junior or senior

Section 2.5: Reason Using Postulates from Algebra
I can use deductive reasoning to write an algebraic proof.
I can identify the reflexive, symmetric, and transitive properties.

Problems 2.5: Match the example on the left to the Property which justifies the statement on the right:

e	12. If AB = 2 and AB + BC = 4 then 2 + BC = 4	a. Addition Property
a	13. If AB = CD then AB + EF = CD + EF	b. Subtraction Property
d	14. If 2x = 8 then x = 4	c. Multiplication Property
g	15. x – 7 = x – 7	d. Division Property
b	16. If x + 7 = 15, then x = 8	e. Substitution Property
i	17. If AB = BC and BC = 3, then AB = 3	f. Distributive Property
c	18. If ½x = 4, then x = 8	g. Reflexive Property
f	19. -2(x + 2) = -2x – 4	h. Symmetric Property
h	20. If y = x + 7 then x + 7 = y	i. Transitive Property

Solve the equation and write a reason for each step. * more than 1 way to solve

21. $4x + 9 = 16 - 3x$

$7x + 9 = 16$ Addition
$7x = 7$ Subtraction
$x = 1$ Division

22. $3(2x + 11) = 9$

$6x + 33 = 9$ Distributive
$6x = -24$ Subtraction
$x = -4$ Division

23. $44 - 2(3x + 4) = -18x$

$44 - 6x - 8 = -18x$ Dist.

$36 - 6x = -18x$ combine

$36 = -12x$ add

$-3 = x$ div.

24. $-4x - 12 = 8$

$-4x = 20$ add

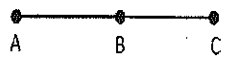
$x = -5$ div.

Section 2.6: Prove Statements about Segments and Angles
I can use deductive reasoning to write a geometric proof.

Problems 2.6

25.

Given: B is the midpoint of AC

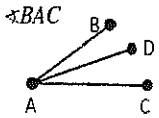


Prove: AB = BC

Steps	Reasons
1. B is the midpoint of $\overline{AC}$	Given
2. AB ≅ BC	If midpt, then ≅
3. AB = BC	If ≅, then =

26.

Given: AD is the bisector of $\angle BAC$

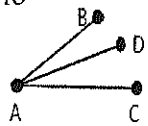


Prove: $m\angle BAD = m\angle CAD$

Steps	Reasons
1. $\overline{AD}$ is the bisector of $\angle BAC$	Given
2. $\angle BAD \cong \angle CAD$	If bisect, then ≅
3. $m\angle BAD = m\angle CAD$	If ≅, then =

27.

Given: D is in the interior of $\angle BAC$



Prove: $m\angle BAD + m\angle DAC = m\angle BAC$

Steps	Reasons
1. D is in the interior of $\angle BAC$	Given
2. $m\angle BAD + m\angle DAC = m\angle BAC$	If p+p, then P+P=W

2.7 Prove Angle Pair Relationships
I can identify angle pairs, describe the relationships between angle pairs, and solve problems using those relationships.

28. $\angle 1$ and $\angle 2$ are supplementary angles and $\angle 1$ and $\angle 3$ are vertical angles. If $m\angle 2 = 12°$, find $m\angle 3$.

$180 - 12 = 168°$ $\cong$ $\angle 3 = 168°$

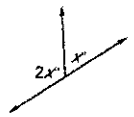
29. $\angle 1$ and $\angle 2$ are complementary angles and $\angle 2$ and $\angle 3$ form a linear pair. If $m\angle 1 = 35°$, find $m\angle 3$.

90° 180°

$90 - 35 = m\angle 2 = 55°$ $180 - 55 = 125°$ $m\angle 3$

30. Find the value of x.

a.)

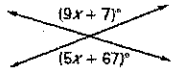


$2x + x = 180$

$3x = 180$

$x = 60$

b.)



$9x + 7 = 5x + 67$

$4x = 60$

$x = 15$