Name: _____

Date: _____

Period: _____

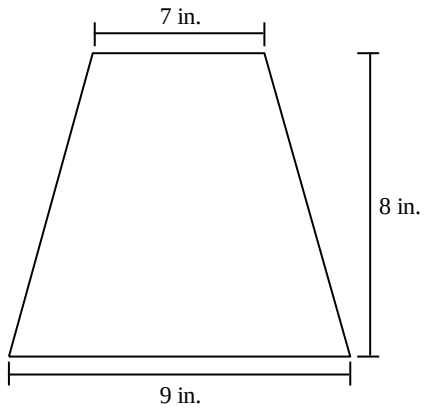
Geometry Cumulative Study Guide

Test 6

Numeric Response

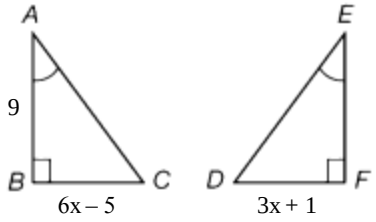
1. Find the base of a rectangle, in inches, with an area of 30 square inches and height of 6 inches.

2. Find the area, in square inches, of the trapezoid below.



3. Find the circumference of the circle with radius of 9 feet. Use 3.14 for π and round to the nearest tenth of a foot.

4. Given that $\overline{AC} \cong \overline{ED}$, find the area, in square units, of each triangle shown below.

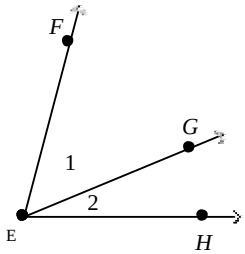


Problem

5. Identify the property that justifies the statement below.

If $a = b$, then $a + c = b + c$.

6. Name three rays in the diagram.



7. After several years of gardening, Mary made the observation that every rose she grew had thorns. She made this conjecture: "All roses have thorns." Is this a valid conjecture? How can it be tested? Can it be proven?

8. Determine whether the statement below is true or false. If it is false, explain your reasoning.

If a shape is a quadrilateral, then it is a parallelogram.

9. Find a counterexample to the conjecture below.

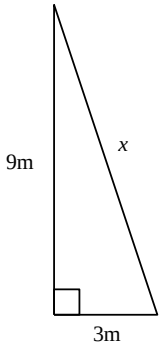
If $x^2 = 64$, then $x = 8$.

10. Identify the hypothesis and conclusion of the statement below. Then, write the negation of each.

If you break it, then you will have to buy it.

11. In the right triangle *XYZ*, $m\angle X = 44°$ and the right angles is at vertex *Z*. Find the measure of $\angle Y$.

12. Find the value of *x* in the triangle below. Give your answer in simplified radical form.



13. Sketch a quadrilateral based on the description below.

In quadrilateral *ABCD*, each side measures 4 meters.

14. Determine the measure of each exterior angle for a regular triangle.

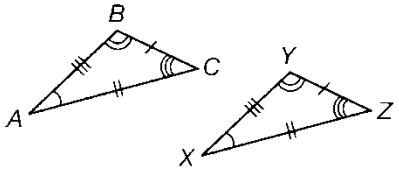
15. For the following statements, use the Law of Detachment to write a valid concluding statement.

If a number is a perfect square, it is not prime.

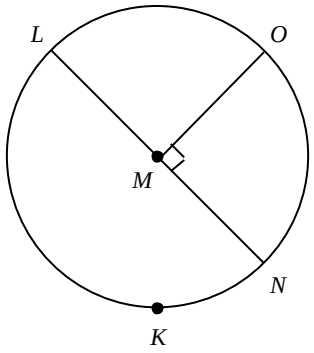
49 is a perfect square.

16. The area of a rectangular blanket is 33 square feet. The blanket's length is $(3x + 8)$ feet and the blanket's width is $3x$ feet. Find the dimensions of the blanket. Provide a justification for each step.

17. Write a congruence statement for the two triangles below.



18. Identify a central angle, minor arc, major arc, and semicircle in $\odot M$.

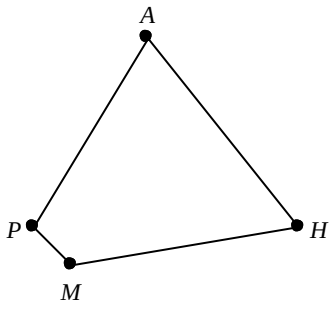


19.Fill in the justifying statements to support the proof of Theorem 6-2: If two angles are supplementary to the same angle, then they are congruent.

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

Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$. $\angle 3$ is supplementary to $\angle 2$.	1.Given
2. $m\angle 1 + m\angle 2 = 180°$ $m\angle 3 + m\angle 2 = 180°$	2. _____
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	3. _____
4. $m\angle 1 + m\angle 2 - m\angle 2 = m\angle 3 + m\angle 2 - m\angle 2$	4. _____
5. $m\angle 1 = m\angle 3$	5. _____
6. $m\angle 1 \cong m\angle 3$	6. _____

20. What is the included side of $\angle A$ and $\angle H$ in the figure below? What is the included angle of $\overline{HM}$ and $\overline{MP}$?



Geometry Cumulative Study Guide Test 6 Answer Section

NUMERIC RESPONSE

1. ANS: 5

   PTS: 1 REF: Lesson 8: Using Formulas in Geometry
   NAT: NCTM G.1d TOP: Cumulative Test 6
2. ANS: 64

   PTS: 1 REF: Lesson 22: Finding Areas of Quadrilaterals
   NAT: NCTM M.2b TOP: Cumulative Test 6
   MSC: Geom_S03_00058
3. ANS: 56.5

   PTS: 1 REF: Lesson 23: Introduction to Circles NAT: NCTM G.1a
   TOP: Cumulative Test 6 MSC: Geom_S03_00063
4. ANS: 31.5

   PTS: 1 REF: Lesson 30: Triangle Congruence: ASA and AAS
   NAT: NCTM M.2b TOP: Cumulative Test 6
   MSC: Geom_S03_00067

PROBLEM

5. ANS:
   Addition Property of Equality

   PTS: 1 REF: Lesson 2: Segments
   TOP: Cumulative Test 6 MSC: Geom_S01_00087
6. ANS:
   $\overrightarrow{EF}$, $\overrightarrow{EG}$, and $\overrightarrow{EH}$

   PTS: 1 REF: Lesson 3: Angles
   TOP: Cumulative Test 6 MSC: Geom_S01_00098
7. ANS:
   Since every observed rose has thorns, the conjecture is valid based on inductive reasoning. The conjecture can be tested by observing as many roses as possible. If even one rose is found that does not have thorns, then the conjecture is disproved. The only way to prove this conjecture is to observe every rose. If every rose can be studied, and they all have thorns, then the conjecture is true. However, it is impossible to study every rose that exists, so the conjecture cannot be proven.

   PTS: 1 REF: Lesson 7: Using Inductive Reasoning
   NAT: NCTM RP.1b TOP: Cumulative Test 6
   MSC: Geom_S01_00121
8. ANS:
   The hypothesis of this statement is true, but the conclusion is false. A trapezoid could be used to contradict this statement. Therefore, the statement is false.

   PTS: 1 REF: Lesson 10: Using Conditional Statements
   NAT: NCTM RP.1b TOP: Cumulative Test 6
   MSC: Geom_S01_00129
9. ANS:
   A counterexample is $x = -8$.

   PTS: 1 REF: Lesson 14: Disproving Conjectures with Counterexamples
   NAT: NCTM RP.1b TOP: Cumulative Test 6
   MSC: Geom_S02_00091
10. ANS:
    Hypothesis: You break it;
    Conclusion: You will have to buy it;
    Negation of Hypothesis: You do not break it;
    Negation of Conclusion: You will not have to buy it.

    MSC: Geom_S01_00070
    NAT: NCTM G.1b

PTS: 1 REF: Lesson 17: More Conditional Statements
NAT: NCTM RP.1b TOP: Cumulative Test 6
MSC: Geom_S02_00100

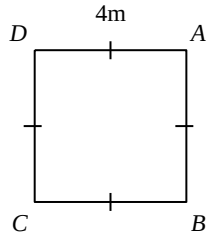
11. ANS:
46°

PTS: 1 REF: Lesson 18: Triangle Theorems NAT: NCTM G.1d
TOP: Cumulative Test 6 MSC: Geom_S02_00106

12. ANS:
$x = 3\sqrt{10}$ meters

PTS: 1 REF: Lesson 18: Triangle Theorems NAT: NCTM G.1d
TOP: Cumulative Test 6 MSC: Geom_S02_00107

13. ANS:
Sample:



PTS: 1 REF: Lesson 19: Introduction to Quadrilaterals
NAT: NCTM G.4a TOP: Cumulative Test 6

14. ANS:
120°

PTS: 1 REF: Investigation 3: Exploring Angles of Polygons
NAT: NCTM G.1d TOP: Cumulative Test 6

15. ANS:
Therefore, 49 is not prime.

PTS: 1 REF: Lesson 21: Laws of Detachment and Syllogism
NAT: NCTM RP.1c TOP: Cumulative Test 6
MSC: Geom_S03_00073

16. ANS:
Sample: The formula for the area of a rectangle is $A = lw$, so $A = 33$, $l = (3x + 8)$, and $w = 3x$.

$A = 33$	Given
$l = (3x + 8)$	Given
$w = 3x$	Given
$A = lw$	Area formula for a rectangle
$33 = (3x + 8)$	(Substitution Property of Equa
$33 = 9x^2 + 24$	Distributive Property
$9x^2 + 24x = 33$	Symmetric Property of Equa
$\frac{9x^2 + 24x}{3} = \frac{33}{3}$	Division Property of Equality
$3x^2 + 8x = 11$	Simplify
$3x^2 + 8x - 11 = 11 - 11$	Subtraction Property of Equa
$3x^2 + 8x - 11 = 0$	Simplify
$(3x + 11)(x - 1) = 0$	Factor

There are two solutions to this factorization, $x = -\frac{11}{3}$ and $x = 1$. However, $-\frac{11}{3}$ gives a negative length, so it is thrown out. Therefore,

$x - 1 = 0$	Given
$x - 1 + 1 = 0 + 1$	Addition Property of Equality
$x = 1$	Simplify

Substitute $x = 1$ into the expression for length and width of the rectangle to find the dimensions.

length = $(3x + 8) = (3(1) + 8) = 11$; 11 feet
width = $3x = 3(1) = 3$; 3 feet

The blanket is 11 feet long and 3 feet wide.

PTS: 1 REF: Lesson 24: Algebraic Proofs NAT: NCTM G.1a
TOP: Cumulative Test 6 MSC: MSC: Geom_S03_00069

Geom_S03_00081

17. ANS:
In these two triangles, *A* corresponds to *X*, *B* corresponds to *Y*, and *C* corresponds to *Z*. Therefore, $\triangle ABC \cong \triangle XYZ$.

PTS: 1 REF: Lesson 25: Triangle Congruence: SSS
NAT: NCTM G.1b TOP: Cumulative Test 6

18. ANS:
Sample: Central angles are $\angle LMO$ and $\angle NMO$. Minor arcs are $\overset{\frown}{OL}$ and $\overset{\frown}{ON}$. Major arcs are $\overset{\frown}{OLN}$ and $\overset{\frown}{ONL}$. Two semi-circles are $\overset{\frown}{NOL}$ and $\overset{\frown}{NKL}$.

PTS: 1 REF: Lesson 26: Central Angles and Arc Measure
NAT: NCTM G.1a TOP: Cumulative Test 6

19. ANS:

Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$. $\angle 3$ is supplementary to $\angle 2$.	1.Given
2. $m\angle 1 + m\angle 2 = 180°$ $m\angle 3 + m\angle 2 = 180°$	2. Definition of supplementary angles
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	
4. $m\angle 1 + m\angle 2 - m\angle 2 = m\angle 3 + m\angle 2 - m$	
5. $m\angle 1 = m\angle 3$	3. Substitution Property
6. $m\angle 1 \cong m\angle 3$	4. Subtraction Property of Equality 5. Simplify 6. Definition of congruence

PTS: 1 REF: Lesson 27: Two-Column Proofs NAT: NCTM RP.1d
TOP: Cumulative Test 6 MSC: Geom_S03_00092

20. ANS:
$\overline{AH}, \angle M$

PTS: 1 REF: Lesson 28: Triangle Congruence: SAS
NAT: NCTM G.1a TOP: Cumulative Test 6

MSC: Geom_S03_00087

MSC: Geom_S03_00089