Name: _____

Date: _____

Period: _____

Geometry Cumulative Study Guide

Test 13

Numeric Response

1.Find the area, in square feet, of a parallelogram if the height is 9 feet and the base is 4 feet.

2.A searchlight rotates $60°$ through a circle that has a radius of 110 feet. What is the area that the searchlight covers? Round to the nearest square foot.

3.Figures *ABCD* and *WXYZ* are similar polygons. Their corresponding sides have a ratio of $6:1$. If the perimeter of figure *ABCD* is 51 inches, what is the perimeter, in inches, of figure *WXYZ*?

4.How many faces does a polyhedron with 27 vertices and 52 edges have?

5.A triangle is equiangular and has a perimeter of 38.7 centimeters. Determine the length, in centimeters, of each side.

6.Find the volume, in cubic feet, of a right prism if the base is a 8-feet-by-6-feet rectangle and the height is 4 feet.

Problem

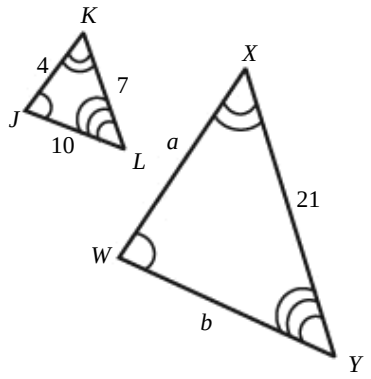
7.For the statement set below, draw a valid conclusion. Identify which law is used to reach the conclusion.

If Betty takes a vacation, she goes to the beach. If Betty goes to the beach, she goes swimming.

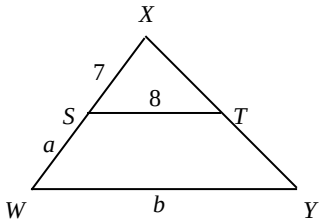
8.Determine whether a triangle with sides 12, 16, and 20 is a right triangle.

9.Find a line that is perpendicular to $y = \frac{1}{7}x$ and passes through point $(-3, 11)$.

10.Find the unknown side lengths in the two similar triangles below.



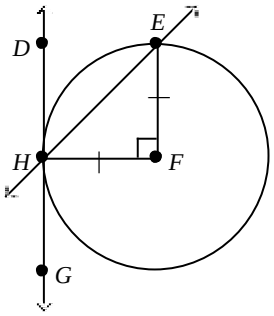
11.In the diagram below, $\overline{ST}$ is a midsegment of $\triangle WXY$. Find the values of *a* and *b*.



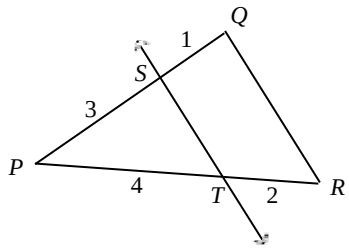
12.A flag is in the shape of an equilateral triangle and each side measures 26 inches. What is the area of the flag? Give your answer in simplified radical form.

13.Find the perimeter of rectangle *ABCD* with coordinates $A(0,-1)$, $B(-2,3)$, $C(4,1)$, and $D(2,5)$. Give your answer in simplified radical form.

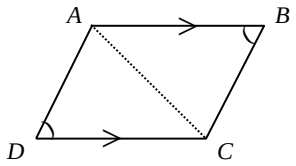
14.If $m\angle DHE = 45°$ in the diagram below, prove that $\overleftrightarrow{DG}$ is tangent to $\odot F$.



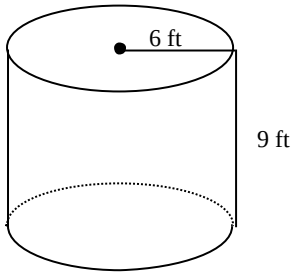
15.Is $\overline{ST}$ parallel to $\overline{QR}$ in the diagram below?



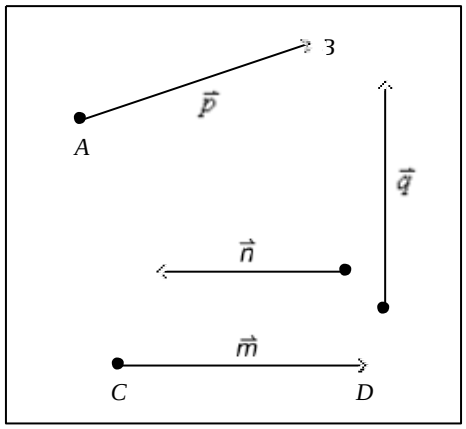
16.In quadrilateral *ABCD* shown below, $\overline{AB} \parallel \overline{DC}$ and $\angle D \cong \angle B$. Is *ABCD* a parallelogram?



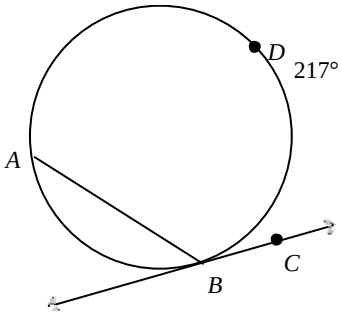
17.Find the lateral area of the cylinder shown below in terms of π.



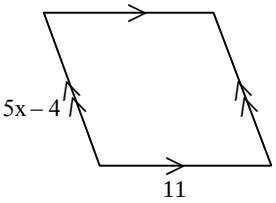
18.Name each vector shown in the diagram below. Identify the terminal points of each vector, if applicable.



19.Find $m\angle ABC$ in the figure below, given that $\overline{BC}$ is a tangent.



20.Is the parallelogram below a rhombus if $x = 3$? Explain.



Geometry Cumulative Study Guide Test 13
Answer Section

NUMERIC RESPONSE

1. ANS: 36

PTS: 1 REF: Lesson 22: Finding Areas of Quadrilaterals
NAT: NCTM M.2b TOP: Cumulative Test 13
MSC: Geom_S03_00061

2. ANS: 6336

PTS: 1 REF: Lesson 35: Finding Arc Lengths and Areas of Sectors
NAT: NCTM M.2b TOP: Cumulative Test 13
MSC: Geom_S04_00059

3. ANS: 8.5

PTS: 1 REF: Lesson 44: Applying Similarity NAT: NCTM G.1b
TOP: Cumulative Test 13 MSC: Geom_S05_00064

4. ANS: 27

PTS: 1 REF: Lesson 49: Introduction to Solids NAT: NCTM G.1a
TOP: Cumulative Test 13 MSC: Geom_S05_00066

5. ANS: 12.9

PTS: 1 REF: Lesson 51: Properties of Isosceles and Equilateral Triangles
NAT: NCTM G.1a TOP: Cumulative Test 13 MSC: Geom_S06_00054

6. ANS: 192

PTS: 1 REF: Lesson 59: Finding Surface Areas and Volumes of Prisms
NAT: NCTM M.2b TOP: Cumulative Test 13
MSC: Geom_S06_00069

PROBLEM

7. ANS:
If Betty takes a vacation, she goes swimming. The Law of Syllogism is used. The first statement is of the form "If *p*, then *q*." The second statement is of the form "If *q*, then *r*." The conclusion follows, "If *p*, then *r*."

PTS: 1 REF: Lesson 21: Laws of Detachment and Syllogism
NAT: NCTM RP.1d TOP: Cumulative Test 13
MSC: Geom_S03_00076

8. ANS:
Use the Pythagorean Theorem.

$a^2 + b^2 = c^2$ Pythagorean Theorem

$12^2 + 16^2 = 20^2$ Substitute

It is a right triangle by the Pythagorean Theorem.

PTS: 1 REF: Lesson 33: Converse of the Pythagorean Theorem
NAT: NCTM G.1c TOP: Cumulative Test 13 MSC: Geom_S04_00077
9. ANS:
$y = -7x - 10$

PTS: 1 REF: Lesson 37: Writing Equations of Parallel and Perpendicular Lines
NAT: NCTM A.4 TOP: Cumulative Test 13 MSC: Geom_S04_00088
10. ANS:
$a = 12$; $b = 30$

PTS: 1 REF: Lesson 41: Ratios, Proportions, and Similarity
NAT: NCTM G.1b TOP: Cumulative Test 13 MSC: Geom_S05_00075
11. ANS:
$a = 7$; $b = 16$

PTS: 1 REF: Lesson 55: Triangle Midsegment Theorem
NAT: NCTM G.1d TOP: Cumulative Test 13 MSC: Geom_S06_00082
12. ANS:
$169\sqrt{3}$ square inches

PTS: 1 REF: Lesson 56: 30°-60°-90° Right Triangles
NAT: NCTM M.2b TOP: Cumulative Test 13
MSC: Geom_S06_00085
13. ANS:
$8\sqrt{5}$

PTS: 1 REF: Lesson 57: Finding Perimeter and Area with Coordinates
NAT: NCTM G.2b TOP: Cumulative Test 13 MSC: Geom_S06_00087
14. ANS:
To show that $\overleftrightarrow{DG}$ is tangent to $\odot F$, it has to be shown that $\angle DHF$ is a right angle. From the diagram, $\triangle EHF$ is an isosceles triangle, so $\angle FEH \cong \angle FHE$. The acute angles of a right triangle are complementary, so both $\angle FEH$ and $\angle FHE$ are $45°$ angles. By the Angle Addition Postulate, $m\angle FHE + m\angle DHE = m\angle DHF$. Substituting shows that $m\angle DHF = 45° + 45°$, so $\angle DHF$ is a right angle. Therefore, by Theorem 58-2, $\overleftrightarrow{DG}$ is tangent to $\odot F$.

PTS: 1 REF: Lesson 58: Tangents and Circles, Part 1
NAT: NCTM G.1c TOP: Cumulative Test 13 MSC: Geom_S06_00090
15. ANS:
$\overline{ST}$ is not parallel to $\overline{QR}$, because $\overline{ST}$ does not divide $\overline{PQ}$ and $\overline{PR}$ proportionally.

PTS: 1 REF: Lesson 60: Proportionality Theorems
NAT: NCTM G.1c TOP: Cumulative Test 13 MSC: Geom_S06_00093
16. ANS:

The diagonal $\overline{AC}$ creates $\triangle ABC$ and $\triangle CDA$. Since $\overline{AB} \parallel \overline{DC}$, the alternate interior angles $\angle BAC$ and $\angle DCA$ are congruent. $\overline{AC}$ is congruent to itself by the Reflexive Property of Congruence. Therefore, $\triangle ABC \cong \triangle CDA$ by the AAS Triangle Congruence Theorem. By CPCTC, $\overline{AB} \cong \overline{DC}$ and $\overline{AD} \cong \overline{BC}$. Since both pairs of opposite sides of *ABCD* are congruent, it is a parallelogram.

PTS: 1 REF: Lesson 61: Determining If a Quadrilateral is a Parallelogram
NAT: NCTM G.1c TOP: Cumulative Test 13 MSC: Geom_S07_00070

17. ANS:

108π square feet

PTS: 1 REF: Lesson 62: Finding Surface Areas and Volumes of Cylinders
NAT: NCTM M.2b TOP: Cumulative Test 13
MSC: Geom_S07_00071

18. ANS:

$\vec{n}$, $\vec{q}$, $\vec{m}$ with terminal point *D*, and $\vec{p}$ with terminal point *B*

PTS: 1 REF: Lesson 63: Introduction to Vectors NAT: NCTM NO.3a
TOP: Cumulative Test 13 MSC: Geom_S07_00074

19. ANS:

$m\angle ABC = 108.5°$

PTS: 1 REF: Lesson 64: Angles Interior to Circles
NAT: NCTM G.1d TOP: Cumulative Test 13 MSC: Geom_S07_00078

20. ANS:

Yes, the side measures 11 units and is congruent to the side that measures 11 units.

PTS: 1 REF: Lesson 65: Distinguishing Types of Parallelograms
NAT: NCTM G.1a TOP: Cumulative Test 13 MSC: Geom_S07_00082