

# Geometry Cumulative Study Guide

Test 9

Name: \_\_\_\_\_

Date: \_\_\_\_\_

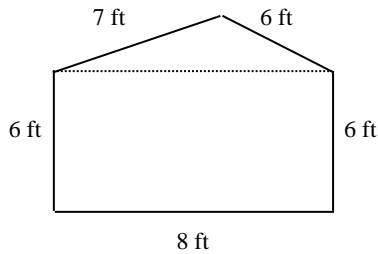
Period: \_\_\_\_\_

## Numeric Response

1. A band of gold surrounds the edge of a circular crown that has a radius of 9 inches. Find the length of the band of gold to the nearest tenth inch. Use 3.14 for  $\pi$ .

2. In triangle  $XYZ$ ,  $\overline{XA}$  is a median, and  $M$  is the centroid of the triangle. What is the length, in centimeters, of  $\overline{XM}$  if  $\overline{XA}$  measures 161.4 centimeters.

3. Find the perimeter, in feet, of the composite figure below.



4. Find the distance, in units, from the point  $P(-9, -5)$  to the line  $x = -4$ .

## Problem

5. State the converse of this statement: *If two angles are vertical angles, then they are congruent.*

Determine whether the original statement and its converse are true.

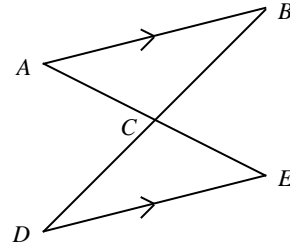
6. What is the sum of the interior angle measures of a convex, irregular quadrilateral?

7. A triangular scarf has an area of 144 square inches. The base of the scarf measures  $3x$  inches and the height measures  $8x + 8$  inches. Find the base and height measurements of the scarf. Provide a justification for each step.

8. What is the included side of  $\triangle STU$  that is between  $\angle TUS$  and  $\angle STU$ .

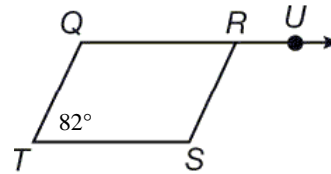
9. Give a Pythagorean triple that is proportional to (119, 408, 425).

10. Write a two-column proof to prove that  $\triangle BAC \cong \triangle DEC$  given that  $C$  is a midpoint of  $\overline{AE}$  and  $\overleftrightarrow{AB} \parallel \overleftrightarrow{DE}$ .

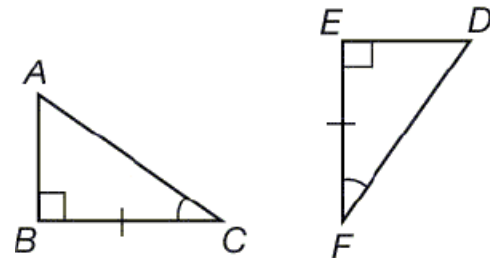


11. A triangle has side lengths that measure 20, 7, and 14 units. Classify the triangle by side lengths and angles.

12. In the parallelogram shown, what are the measures of  $\angle TQR$ ,  $\angle QRS$ , and  $\angle SRU$ ?



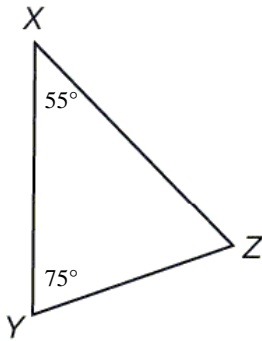
13. Use the LA Congruence Theorem to prove that  $\triangle ABC$  and  $\triangle DEF$  are congruent.



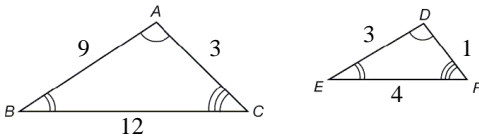
14. Find a line that is parallel to  $y = 4x + 5$  and passes through the point  $(-5, -4)$ .

15. A supermarket chain has three stores located throughout the city at points  $A(0, 3)$ ,  $B(-8, 3)$ , and  $C(-8, -5)$ . The supermarket warehouse is equidistant from the three stores. Find the location of the warehouse.

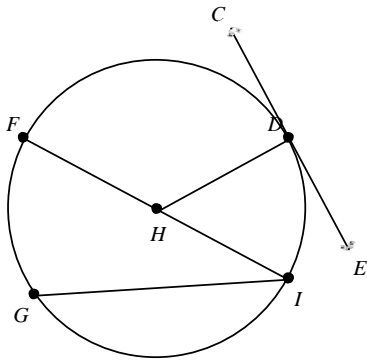
16. Order the lengths of  $\triangle XYZ$  from least to greatest.



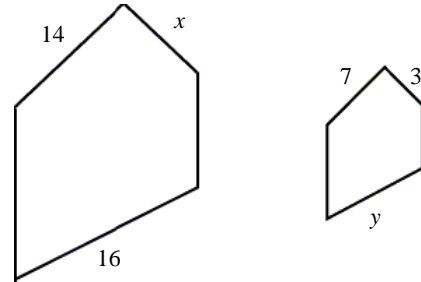
17. Consider  $\triangle ABC$  and  $\triangle DEF$  shown below. Write a proportion to show that  $AB : DE = BC : EF$ .



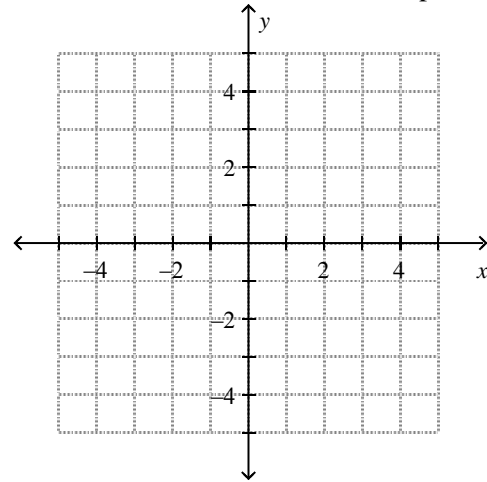
18. Name a tangent line to the circle shown below and identify the point of tangency.



19. The pentagons in the diagram are similar. Find the values of  $x$  and  $y$ .



20. Triangle  $DEF$  has a base of 3 units and a height of 4 units. Angle  $F$  is a right angle. Position  $\triangle DEF$  on the coordinate plane.



## Geometry Cumulative Study Guide Test 9 Answer Section

### NUMERIC RESPONSE

1. ANS: 56.5

PTS: 1 REF: Lesson 23:  
Introduction to Circles NAT:  
NCTM G.1a  
TOP: Cumulative Test 9  
MSC: Geom\_S03\_00066

2. ANS: 107.6

PTS: 1 REF: Lesson 32:  
Altitudes and Medians of Triangles  
NAT: NCTM G.1d TOP: Cumulative Test 9

3. ANS: 33

PTS: 1 REF: Lesson 40: Finding  
Perimeters and Areas of Composite Figures  
NAT: NCTM G.1a TOP: Cumulative Test 9

4. ANS: 5

PTS: 1 REF: Lesson 42: Finding  
Distance from a Point to a Line  
NAT: NCTM G.1d TOP: Cumulative Test 9

### PROBLEM

5. ANS:

Converse: *If two angles are congruent, then they are vertical angles.* The original statement is true. Its converse is not true.

PTS: 1 REF: Lesson 20:  
Interpreting Truth Tables  
NAT: NCTM RP.1b  
TOP: Cumulative Test 9  
MSC: Geom\_S02\_00116

6. ANS:  
360°

PTS: 1 REF: Investigation 3:  
Exploring Angles of Polygons  
NAT: NCTM G.1a TOP: Cumulative Test 9

7. ANS:

Sample: The formula for the area of a triangle is

$$A = \frac{1}{2}bh, \text{ so}$$

$$A = 144, b = 3x, h = 8x + 8 \quad \text{Given}$$

$$A = \frac{1}{2}bh \quad \text{Area formula for a triangle}$$

$$144 = \frac{1}{2}(3x)(8x + 8) \quad \text{Substitution}$$

$$\text{Property of Equality}$$

$$144 = \frac{1}{2}(24x^2 + 24x) \quad \text{Distributive Property}$$

$$144 = 12x^2 + 12x \quad \text{Distributive Property}$$

$$12x^2 + 12x = 144 \quad \text{MSC: Geom_S04_00056}$$

$$\text{Symmetric Property of Equality}$$

$$12x^2 + 12x - 144 = 144 - 144 \quad \text{Subtraction Property of Equality}$$

$$\text{MSC: Geom_S04_00063}$$

$$12x^2 + 12x - 144 = 0 \quad \text{Simplify}$$

$$12(x + 4)(x - 3) = 0 \quad \text{Factor}$$

There are two solutions to this factorization,  $x = -4$  and  $x = 3$ . However,  $x = -4$  gives a negative solution, so it is thrown out. Therefore,

$$x - 3 = 0 \quad \text{Given}$$

$$x - 3 + 3 = 0 + 3 \quad \text{Addition Property of Equality}$$

$$x = 3 \quad \text{Simplify}$$

Substitute  $x = 3$  into the expressions for base and height.

$$\text{base} = 3x = 3(3) = 9$$

$$\text{height} = 8x + 8 = 8(3) + 8 = 24 + 8 = 32$$

Therefore, the base of the scarf is 9 inches and the height is 32 inches.

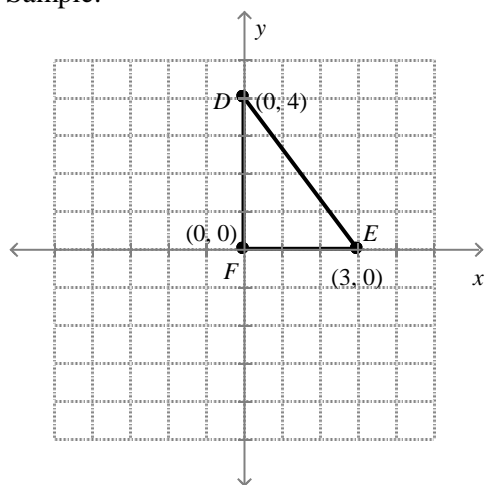
PTS: 1 REF: Lesson 24:  
Algebraic Proofs NAT: NCTM A.2b  
TOP: Cumulative Test 9  
MSC: Geom\_S03\_00084

8. ANS:  
 $\overline{TU}$
- PTS: 1 REF: Lesson 28:  
Triangle Congruence: SAS  
NAT: NCTM G.1a TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00097~~
9. ANS:  
Sample: (7, 24, 25)
- PTS: 1 REF: Lesson 29: Using  
the Pythagorean Theorem  
NAT: NCTM G.1b TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00101~~
10. ANS:  
1.  $C$  is the midpoint of  $\overline{AE}$  1. Given  
2.  $\overline{AC} \cong \overline{CE}$  2. Definition of midpoint  
3.  $\angle BAC \cong \angle CED$  3. If two parallel lines are cut by a transversal, then alternate interior angles are congruent.  
4.  $\angle ACB \cong \angle ECD$  4. Vertical angles are congruent.  
5.  $\triangle BAC \cong \triangle DEC$  5. ASA Congruence Postulate
- PTS: 1 REF: Lesson 30:  
Triangle Congruence: ASA and AAS  
NAT: NCTM RP.1c  
TOP: Cumulative Test 9  
MSC: Geom\_S03\_00104
11. ANS:  
Scalene; Obtuse
- PTS: 1 REF: Lesson 33:  
Converse of the Pythagorean Theorem  
NAT: NCTM G.1a TOP: Cumulative Test 9  
MSC: ~~Geom\_S04\_00075~~
12. ANS:  
 $98^\circ, 82^\circ, 98^\circ$
- PTS: 1 REF: Lesson 34:  
Properties of Parallelograms  
NAT: NCTM G.1d TOP: Cumulative Test 9  
MSC: ~~Geom\_S04\_00079~~
13. ANS:
- Sample:  $\triangle ABC$  and  $\triangle DEF$  are both right triangles, so the LA Right Triangle Congruence Theorem can be used. The legs  $\overline{BC}$  and  $\overline{FE}$  are congruent as given. Acute angles  $\angle C$  and  $\angle F$  are also congruent. Therefore, by the LA Right Triangle Congruence Theorem,  
 $\triangle ABC \cong \triangle DEF$ .
- PTS: 1 REF: Lesson 36: Right  
Triangle Congruence Theorems  
NAT: NCTM G.1c TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00101~~
14. ANS:  $y = 4x + 16$
- PTS: 1 REF: Lesson 37: Writing  
Equations of Parallel and Perpendicular Lines  
NAT: NCTM A.4 TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00101~~
15. ANS:  
 $(-4, -1)$
- PTS: 1 REF: Lesson 38:  
Perpendicular and Angle Bisectors of Triangles  
NAT: NCTM G.2a TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00101~~
16. ANS:  
 $\overline{XY}, \overline{YZ}, \overline{XZ}$
- PTS: 1 REF: Lesson 39:  
Inequalities in a Triangle  
NAT: NCTM G.1a TOP: Cumulative Test 9  
MSC: ~~Geom\_S03\_00104~~
17. ANS:  
 $\frac{9}{3} = \frac{12}{4}$
- PTS: 1 REF: Lesson 41: Ratios,  
Proportions, and Similarity  
NAT: NCTM G.1a TOP: Cumulative Test 9  
MSC: ~~Geom\_S04\_00075~~
18. ANS:  
The tangent is  $\overleftrightarrow{CE}$  and the point of tangency is  $D$ .
- PTS: 1 REF: Lesson 43: Chords,  
Secants, and Tangents  
NAT: NCTM G.1a TOP: Cumulative Test 9  
MSC: ~~Geom\_S04\_00079~~
19. ANS:

$$x = 6, y = 8$$

PTS: 1 REF: Lesson 44:  
Applying Similarity NAT: NCTM G.1b  
TOP: Cumulative Test 9  
MSC: Geom\_S05\_00080

20. ANS:  
Sample:



PTS: 1 REF: Lesson 45:  
Introduction to Coordinate Proofs  
NAT: NCTM G.2b TOP: Cumulative Test 9  
MSC: Geom\_S05\_00084

MSC: Geom\_S05\_00084