Name: ___________________________

Geometry Cumulative Study Guide

Test 10

Date: ___________________________

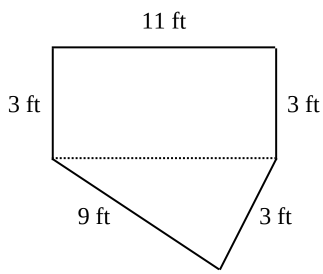
Period: ___________________________

Numeric Response

1. Find the geometric mean of 3 and 12.

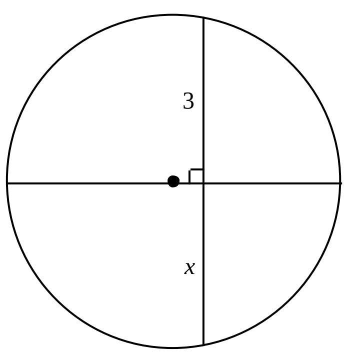
2. Determine the slope of the line passing through (6, 5) and (5, –3).

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



4. Solve the proportion $\frac{3}{12} = \frac{x}{4}$ to find the value of x.

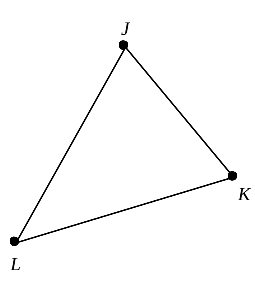
5. Find the length of x in the diagram below.



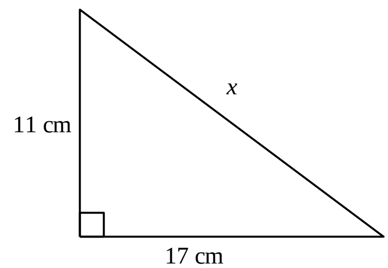
Problem

6. The measure of $\overset{\frown}{AB}$ is given by the expression $6x - 17$, and the measure of $\overset{\frown}{XY}$ is given by the expression $4x + 11$. It is given that $\overset{\frown}{AB} \cong \overset{\frown}{XY}$. Determine the value of x and the measure of each arc.

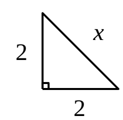
7. What is the included side of $\angle J$ and $\angle K$ in the triangle below? What is the included angle of $\overline{JL}$ and $\overline{KL}$?



8. Find the unknown length x in the triangle below. Do the side lengths form a Pythagorean triple?



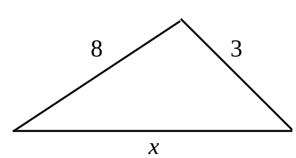
9. Find the value of x in the diagram below. Write your answer in simplified radical form.



10. Find the area of sector AOB with radius 12 feet and $m\overset{\frown}{AOB} = 280°$. Give your answer in terms of π.

11. Are the lines $y = \frac{2}{3}x - 7$ and $y = -5 + \frac{5}{9}x$ parallel, perpendicular, or neither?

12. Find the range of values for x in the triangle below.



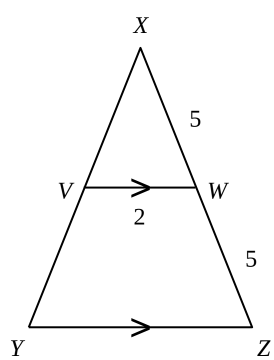
13. Draw a net for a triangular prism.

14. A school provides bus service only to students who live a distance greater than 2 miles away from the school. On a coordinate plane, the school is located at the origin, and Michael lives at the closest point to the school on Maple Street, which can be represented by the line $y = 5x - 4$. If each unit on the coordinate plane represents 1 mile, does Michael live far enough from the school for bus service?

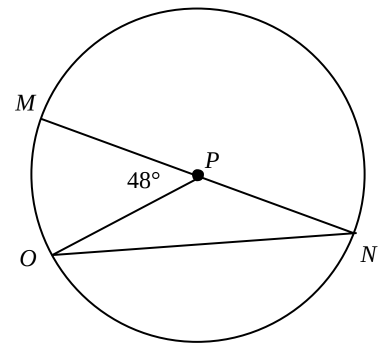
15. Given that $\triangle ABC \sim \triangle QRS$, prove algebraically that the ratio of their perimeters is 1 : 4 if the ratio of their corresponding sides is 1 : 4.

16. Assign coordinates to the vertices of isosceles triangle *PQR* with a height of 2 from the base to the vertex.

17. Show that the two triangles below are similar if $\overline{VW} \parallel \overline{YZ}$. Then find *YZ*.

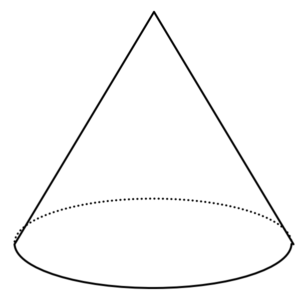


18. Name the inscribed angle shown in the circle below



19. Write an indirect proof to prove Theorem 4-2: If there is a line and a point not on the line, then exactly one plane contains them.

20. Classify the three-dimensional solid shown below.



Geometry Cumulative Study Guide Test 10
Answer Section

NUMERIC RESPONSE

1. ANS: 6

   PTS: 1 REF: Lesson 50: Geometric Mean NAT: NCTM G.4d
   TOP: Cumulative Test 10 MSC: Geom_S05_00067

2. ANS: 8

   PTS: 1 REF: Lesson 16: Finding Slopes and Equations of Lines
   NAT: NCTM A.4 TOP: Cumulative Test 10 MSC: Geom_S02_00075

3. ANS: 29

   PTS: 1 REF: Lesson 40: Finding Perimeters and Areas of Composite Figures
   NAT: NCTM G.1a TOP: Cumulative Test 10 MSC: Geom_S04_00064

4. ANS: 1

   PTS: 1 REF: Lesson 41: Ratios, Proportions, and Similarity
   NAT: NCTM A.2b TOP: Cumulative Test 10 MSC: Geom_S05_00055

5. ANS: 3

   PTS: 1 REF: Lesson 43: Chords, Secants, and Tangents
   NAT: NCTM G.1d TOP: Cumulative Test 10 MSC: Geom_S05_00061

PROBLEM

6. ANS:
   $x = 14$; $m\overset{\frown}{AB} = 67°$; $m\overset{\frown}{XY} = 67°$

   PTS: 1 REF: Lesson 26: Central Angles and Arc Measure
   NAT: NCTM G.4d TOP: Cumulative Test 10 MSC: Geom_S03_00091

7. ANS:
   $\overline{JK}$; $\angle L$

   PTS: 1 REF: Lesson 28: Triangle Congruence: SAS
   NAT: NCTM G.1a TOP: Cumulative Test 10

8. ANS:
   $x = \sqrt{410}$; No, because Pythagorean triples must be whole numbers.

   PTS: 1 REF: Lesson 29: Using the Pythagorean Theorem
   NAT: NCTM G.1d TOP: Cumulative Test 10

9. ANS:
   $2\sqrt{2}$

   PTS: 1 REF: Lesson 33: Converse of the Pythagorean Theorem
   NAT: NCTM G.1d TOP: Cumulative Test 10

10. ANS:
    112π square feet

    PTS: 1 REF: Lesson 35: Finding Arc Lengths and Areas of Sectors
    NAT: NCTM M.2b TOP: Cumula
    MSC: Geom_S04_00081

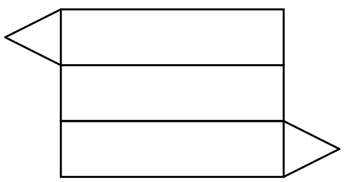
11. ANS:
    Neither

    PTS: 1 REF: Lesson 37: Writing Equations of Parallel and Perpendicular Lines
    NAT: NCTM A.4 TOP: Cumulative Test 10

12. ANS:
    $5 < x < 11$

    PTS: 1 REF: Lesson 39: Inequalities in a Triangle
    NAT: NCTM G.1a TOP: Cumulative Test 10

13. ANS:
    Sample:



PTS: 1 REF: Investigation 5: Nets NAT: NCTM G.4a
TOP: Cumulative Test 10 MSC: Geom_S05_00071

14. ANS:
$d \approx 0.78$ miles, which is less than 2 miles, so Michael does not live far enough from the school for the bus service.

PTS: 1 REF: Lesson 42: Finding Distance from a Point to a Line
NAT: NCTM G.1d TOP: Cumulative Test 10 MSC: Geom_S05_00076

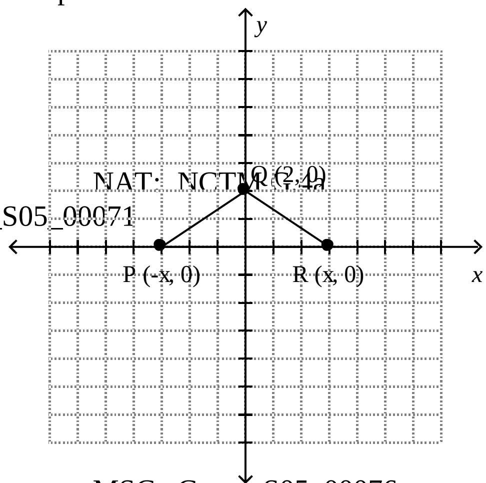
15. ANS:

Statements	Reasons
1. $\triangle ABC \sim \triangle QRS$	1. Given
2. $\frac{AB}{QR} = \frac{BC}{RS} = \frac{CA}{SQ} = \frac{1}{4}$	2. Given
3. $4AB = QR$	3. Cross multiply.
4. $4BC = RS$	4. Cross multiply.
5. $4CA = SQ$	5. Cross multiply.
6. perimeter of $\triangle QRS = QR + RS + SQ$	6. Definition of Perimeter
7. perimeter of $\triangle QRS = 4AB + 4BC + 4CA$	7. Substitute
8. perimeter of $\triangle QRS = 4(AB + BC + CA)$	8. Simplify
9. perimeter of $\triangle ABC = AB + BC + CA$	9. Definition of Perimeter
10. perimeter of $\triangle QRS = 4(\text{perimeter of } \triangle ABC)$	10. Substitute

Therefore, the ratio of the perimeter of $\triangle ABC$ to the perimeter of $\triangle QRS$ is 1 : 4.

PTS: 1 REF: Lesson 44: Applying Similarity NAT: NCTM RP.1c
TOP: Cumulative Test 10 MSC: Geom_

16. ANS:
Sample:



PTS: 1 REF: Lesson 45: Introduction to Coordinate Proofs
NAT: NCTM G.2b TOP: Cumulative Test 10

17. ANS:
First, show that the triangles are similar.

1. $\overline{VW} \parallel \overline{YZ}$	1. Given
2. $m\angle VWX = m\angle YZX$	2. Corresponding angles
3. $m\angle WVX = m\angle ZYX$	3. Corresponding angles
4. $\triangle VWX \sim \triangle YZX$	4. AA Similarity Postulate

YZ = 4

Since the triangles are similar, the ratios of the lengths of the corresponding sides are equal.

VW : YZ = WX : ZX

$\frac{VW}{YZ} = \frac{WX}{ZX}$; $\frac{2}{YZ} = \frac{5}{10}$; $5(YZ) = 20$; $YZ = 4$.

PTS: 1 REF: Lesson 46: Triangle Similarity: AA, SSS, SAS
NAT: NCTM G.1b TOP: Cumulative Test 10 MSC: Geom_S05_00088

18. ANS:
$\angle MNO$

PTS: 1 REF: Lesson 47: Circles and Inscribed Angles
NAT: NCTM G.1a TOP: Cumulative Test 10 MSC: Geom_S05_00091

19. ANS:
Suppose that line *AB* does not contain point *C*. Assume that line *AB* and point *C* cannot be contained by exactly one plane. Since points *A*, *B*, and *C* are noncollinear, this contradicts Postulate 6, which states that through any three noncollinear points there exists exactly one plane. The assumption is contradicted and Theorem 4-2 must be true.

PTS: 1 REF: Lesson 48: Indirect Proofs NAT: NCTM RP.1c
TOP: Cumulative Test 10 MSC: Geom_S05_00093

20. ANS:
Cone

PTS: 1 REF: Lesson 49: Introduction to Solids NAT: NCTM G.1a
TOP: Cumulative Test 10 MSC: Geom_S05_00095