Name: _____

Date: _____

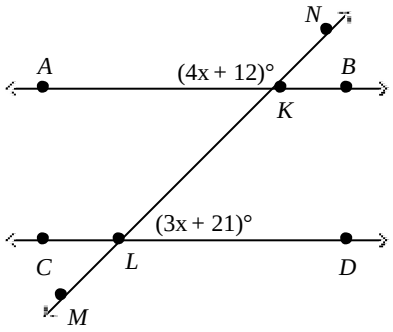
Period: _____

Geometry Cumulative Study Guide

Test 3

Numeric Response

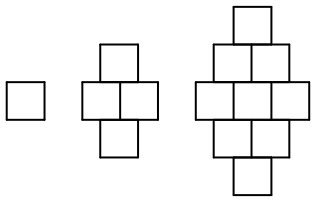
1. Lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are parallel. Find $m\angle CLM$.



2. Use inductive reasoning to determine the next term in the series:

   8, 12, 11, 15, 14, 18, 17, ____

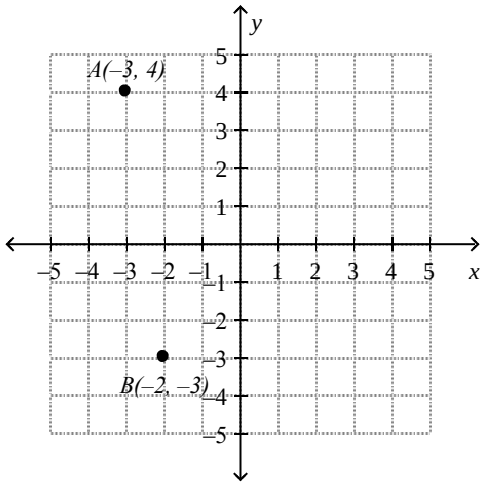
3. Look at the progression of the pattern below and formulate a conjecture regarding the number of squares there will be in the fifth step of this pattern.



4. Find the area of a right triangle with a hypotenuse of 11 cm and a leg of 4 cm. Round to the nearest hundredth of a square centimeter.

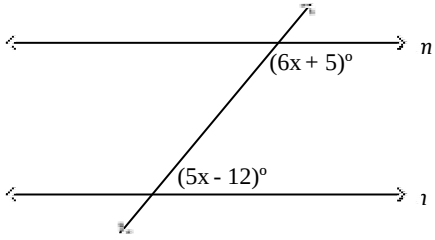
5. Find the base of a rectangle, in inches, with an area of 30 square inches and height of 6 inches.

6. What is the length of $\overleftrightarrow{AB}$? Round to the nearest hundredth.



7. Find the distance between the points (1, –12) and (9, –6).

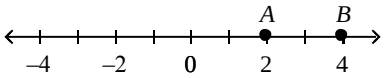
8. Find the value of x so that $m \parallel n$.



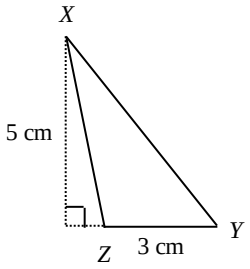
9. Find a value for *x* that provides a counterexample for this conjecture.

   If *x* is a real number, then $\frac{4x-8}{3x-6} = \frac{4}{3}$.

10. On the number line below, what is the midpoint of A and B?

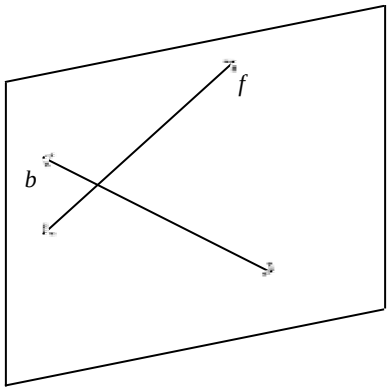


11. Determine the area of $\triangle XYZ$ in square centimeters.

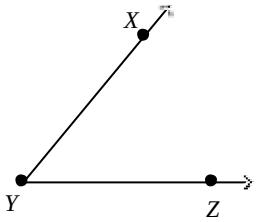


Problem

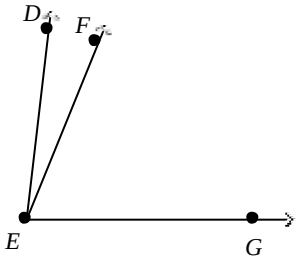
12. Identify the coplanar and noncoplanar lines in the diagram below.



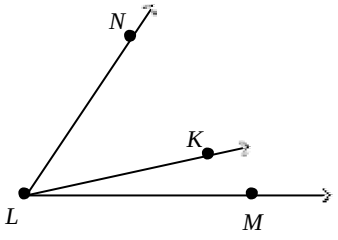
13. Classify $\angle XYZ$ and use a protractor to find its measure.



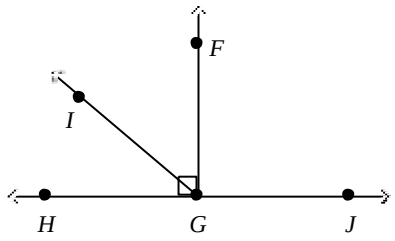
14. $m\angle DEF = 15°$ and $m\angle FEG = 68°$. Find $m\angle DEG$. Classify $\angle DEG$.



15. $m\angle KLM = 12°$ and $m\angle NLM = 56°$. Find $m\angle NLK$. Classify $\angle NLK$.



16. Which angle is complementary to $\angle IGH$? Which angle is supplementary to it?



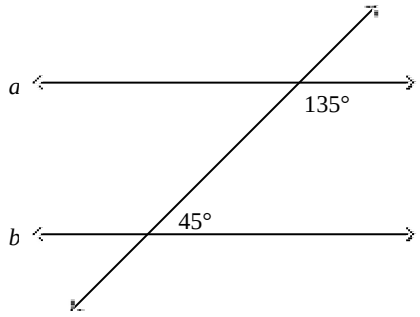
17. Determine if the following conditional statement is true. *If an angle is acute, then its measure is 45°.* If it is false, give an example which shows why it is false.

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

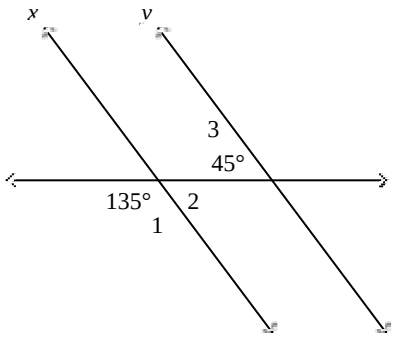
If a shape is a quadrilateral, then it is a parallelogram.

19. Determine the midpoint of the line segment with endpoints (4, 2) and (5, –4).

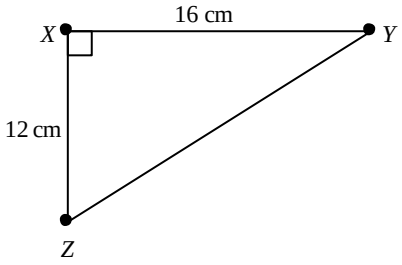
20. Prove that lines *a* and *b* are parallel.



21. Prove that lines *x* and *y* in this figure are parallel.



22. Classify $\triangle XYZ$ and calculate its perimeter and area.



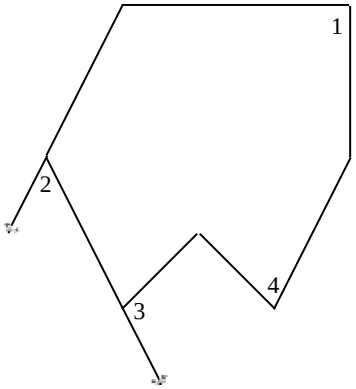
a. Find *YZ*.
b. Classify $\triangle XYZ$ by sides. Justify your answer.
c. Is $\triangle XYZ$ an acute triangle? Justify your answer.
d. Find the perimeter of $\triangle XYZ$.
e. Find the area of $\triangle XYZ$.

23. Consider the following conjecture.

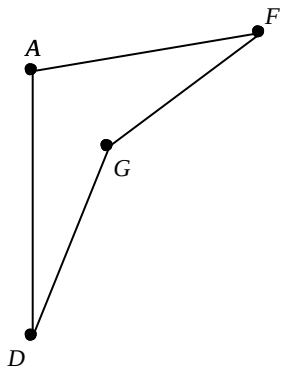
    If the product of two numbers is negative, then both numbers are negative.

    What is the hypothesis of the conjecture? What is its conclusion? Find a counterexample to the conjecture.

24. For each numbered angle in the polygon, determine whether it is an interior angle or an exterior angle.



25. Determine whether polygon *ABCD* is convex or concave. Explain.



Cumulative Study Guide Test 3 Geometry
Answer Section

NUMERIC RESPONSE

1. ANS: 84

   PTS: 1 REF: Investigation 1: Transversals and Angle Relationships
   NAT: NCTM G.1d TOP: Cumulative Test 3 MSC: Geom_S01_00052
2. ANS: 21

   PTS: 1 REF: Lesson 7: Using Inductive Reasoning
   NAT: NCTM RP.1d TOP: Cumulative Test 2
   MSC: Geom_S01_00062
3. ANS: 25

   PTS: 1 REF: Lesson 7: Using Inductive Reasoning
   NAT: NCTM RP.1b TOP: Cumulative Test 4
   MSC: Geom_S01_00064
4. ANS: 20.49

   PTS: 1 REF: Lesson 8: Using Formulas in Geometry
   NAT: NCTM M.2b TOP: Cumulative Test 2
   MSC: Geom_S01_00066
5. ANS: 5

   PTS: 1 REF: Lesson 8: Using Formulas in Geometry
   NAT: NCTM G.1d TOP: Cumulative Test 6 MSC: Geom_S01_00070
6. ANS: 7.07

   PTS: 1 REF: Lesson 9: Finding Length: Distance Formula
   NAT: NCTM G.1d TOP: Cumulative Test 2 MSC: Geom_S01_00071
7. ANS: 10

   PTS: 1 REF: Lesson 9: Finding Length: Distance Formula
   NAT: NCTM G.1d TOP: Cumulative Test 4 MSC: Geom_S01_00073
8. ANS: 17

   PTS: 1 REF: Lesson 12: Proving Lines Parallel NAT: NCTM RP.1c
   MSC: Geom_S02_00065
9. ANS: 2

   PTS: 1 REF: Lesson 14: Disproving Conjectures with Counterexamples
   NAT: NCTM RP.1b MSC: Geom_S02_00067
10. ANS: 3

    PTS: 1 REF: Lesson 11: Finding Midpoints NAT: NCTM NO.3a
    TOP: Cumulative Test 4 MSC: Geom_S02_00070
11. ANS: 7.5

PTS: 1 REF: Lesson 13: Introduction to Triangles
NAT: NCTM M.2b TOP: Cumulative Test 7
MSC: Geom_S02_00073

PROBLEM

12. ANS:
Lines *b* and *f* are coplanar; there are no noncoplanar lines.

PTS: 1 REF: Lesson 1: Points, Lines, and Planes NAT: NCTM G.1a
TOP: Cumulative Test 1 MSC: Geom_S01_00079

13. ANS:
acute; 50°

PTS: 1 REF: Lesson 3: Angles NAT: NCTM G.1a
TOP: Cumulative Test 1 MSC: Geom_S01_00089

14. ANS:
$m\angle DEG = 83°$; acute

PTS: 1 REF: Lesson 3: Angles NAT: NCTM G.1d
TOP: Cumulative Test 1 MSC: Geom_S01_00090

15. ANS:
$m\angle NLK = 44°$; acute

PTS: 1 REF: Lesson 3: Angles NAT: NCTM G.1d
TOP: Cumulative Test 2 MSC: Geom_S01_00092

16. ANS:
complementary: $\angle FGI$, supplementary: $\angle JGI$

PTS: 1 REF: Lesson 6: Identifying Pairs of Angles
NAT: NCTM CM.1d TOP: Cumulative Test 2
MSC: Geom_S01_00115

17. ANS:
False. Other angle measures are possible, e.g. 30°

PTS: 1 REF: Lesson 10: Using Conditional Statements
NAT: NCTM RP.1c TOP: Cumulative Test 2
MSC: Geom_S01_00125

18. 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

19. ANS:
(4.5, –1)

PTS: 1 REF: Lesson 11: Finding Midpoints NAT: NCTM G.1d
TOP: Cumulative Test 7 MSC: Geom_S02_00080

20. ANS:
The lines are parallel by the Converse of the Same-Side Interior Angles Theorem (Theorem 12-3).

PTS: 1 REF: Lesson 12: Proving Lines Parallel NAT: NCTM RP.1d
TOP: Cumulative Test 4 MSC: Geom_S02_00083

21. ANS:
Sample: Angles 1 and 2 form a linear pair. Therefore they are supplementary angles. Using definition of supplementary angles, since $m\angle 1 = 135°$, then $m\angle 2 = 45°$. Since $m\angle 2 = m\angle 3$, then $m\angle 2 \cong m\angle 3$. Angles 2 and 3 are alternate interior angles, so by the Converse of the Alternate Interior Angles Theorem, lines *x* and *y* are parallel.

PTS: 1 REF: Lesson 12: Proving Lines Parallel NAT: NCTM RP.1c
TOP: Cumulative Test 5 MSC: Geom_S02_00084

22. ANS:
a. 20 centimeters
b. Scalene; Sample: Since no sides are congruent, $\triangle XYZ$ is a scalene triangle.
c. No; Sample: $\triangle XYZ$ is not an acute triangle since $m\angle X = 90°$.
d. 48 centimeters
e. 96 square centimeters

PTS: 1 REF: Lesson 13: Introduction to Triangles
NAT: NCTM M.2b TOP: Benchmark Test 1
MSC: Geom_S02_00085

23. ANS:
Hypothesis: The product of two numbers is negative.
Conclusion: Both numbers are negative.
Sample counterexample: $(2)(-3) = -6$

PTS: 1 REF: Lesson 14: Disproving Conjectures with Counterexamples
NAT: NCTM RP.1b TOP: Cumulative Test 7
MSC: Geom_S02_00092

24. ANS:
$\angle 1$ and $\angle 4$ are interior; $\angle 2$ and $\angle 3$ are exterior

PTS: 1 REF: Lesson 15: Introduction to Polygons
NAT: NCTM G.1a TOP: Cumulative Test 5 MSC: Geom_S02_00095

25. ANS:
Concave. $\overline{FD}$ contains points in the exterior of the polygon.

PTS: 1 REF: Lesson 15: Introduction to Polygons
NAT: NCTM G.1a TOP: Cumulative Test 7 MSC: Geom_S02_00096