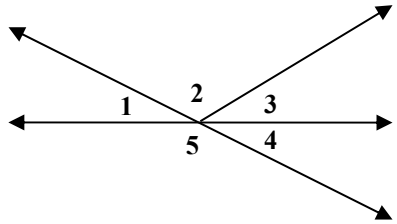
Geometry H Semester 1 Practice Exam

1. Use the figure below.



Which best describes the pair of angles: $\angle 4$ and $\angle 5$?

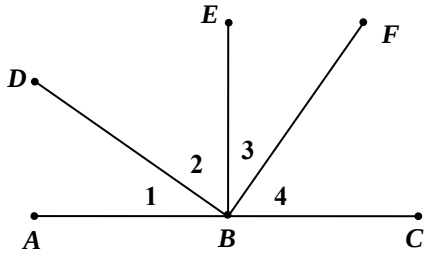
A. vertical

B. adjacent

C. linear pair

D. complementary

2. In the diagram below, $\angle DBF$, $\angle EBC$, and $\angle EBA$ are right angles.



Which best describes the pair of angles: $\angle 1$ and $\angle 4$?

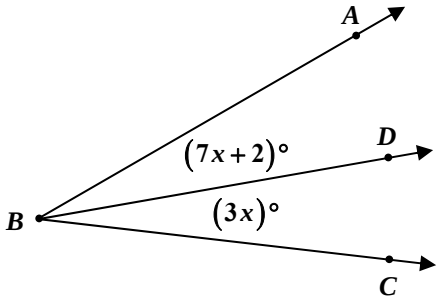
A. vertical

B. adjacent

C. supplementary

D. complementary

3. In the diagram below, $m\angle ABC = 42°$.



What is the value of x?

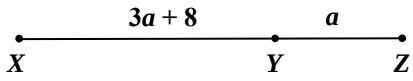
A. 2

B. $3\frac{1}{2}$

C. 4

D. $4\frac{2}{5}$

4. In the figure below, Y is between X and Z and $XZ = 40$ cm.



What is the value of a?

A. 4

B. 8

C. 12

D. 16

5. What is the distance between points $A(-2,-6)$ and $B(-2,-3)$?

A. 3

B. $\sqrt{41}$

C. 9

D. $\sqrt{89}$

6. What are the coordinates of the midpoint of the segment joining the points $A(-3,-4)$ and $B(4,2)$?

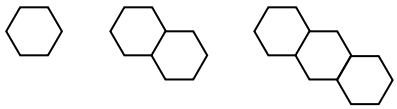
A. $\left(-3\frac{1}{2},3\right)$

B. $\left(-\frac{1}{2},-1\right)$

C. $\left(\frac{1}{2},-1\right)$

D. $\left(\frac{1}{2},-3\right)$

7. In the pattern below, the sides of each regular hexagon have a length of 1 unit.



What is the perimeter of the 5^{th} figure?

A. 18 units

B. 22 units

C. 26 units

D. 30 units

8. In the scientific method, after one makes a conjecture, one tests the conjecture. What type of reasoning is used?

A. conclusive

B. deductive

C. inductive

D. scientific

9. All donks are widgets. Which statement can be written using the rules of logic?

A. A donk is a widget if and only if it is an object.

B. An object is a donk if and only if it is a widget.

C. If an object is a widget, then it is a donk.

D. If an object is a donk, then it is a widget.

10. Which statement is the inverse of: *If x = 5, then x > 3*?

A. If $x = 3$, then $x < 5$.

B. If $x \leq 3$, then $x \neq 5$.

C. If $x > 3$, then $x = 5$.

D. If $x \neq 5$, then $x \leq 3$.

11. Which is a valid counterexample of the converse of the statement: *If Hedley lives in North Las Vegas, then he lives in Nevada*?

A. Hedley lives in Phoenix.

B. Hedley lives in California.

C. Hedley lives in Reno.

D. Hedley lives in the United States.

12. Which is the contrapositive to the statement: *If n is odd, then $n^2 + 2n + 1$ is even.*

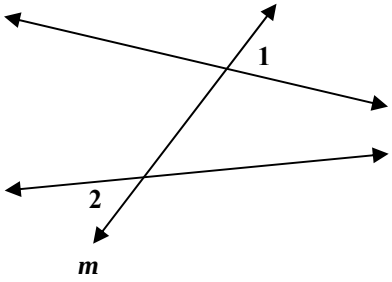
A. If $n^2 + 2n + 1$ is odd, then n is even.

B. If $n^2 + 2n + 1$ is even, then n is odd.

C. If n is even, then $n^2 + 2n + 1$ is odd.

D. If n is even, then $n^2 + 2n + 1$ is even.

13. In the figure below, line *m* is a transversal.



Which best describes the pair of angles: $\angle 1$ and $\angle 2$?

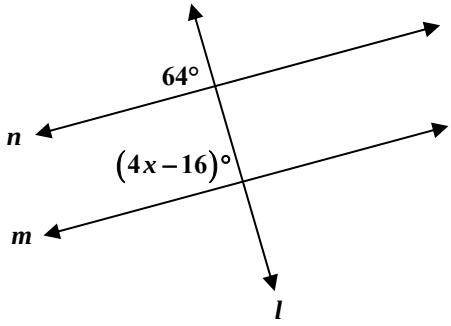
A. alternate exterior

B. alternate interior

C. corresponding

D. vertical

14. In the figure below, $n \parallel m$ and *l* is a transversal.



What is the value of *x*?

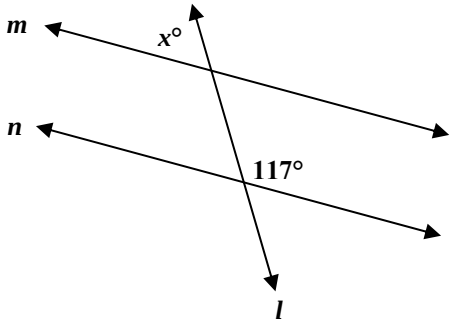
A. 33

B. 29

C. 20

D. 16

15. In the figure below, $n \parallel m$ and *l* is a transversal.



What is the value of *x*?

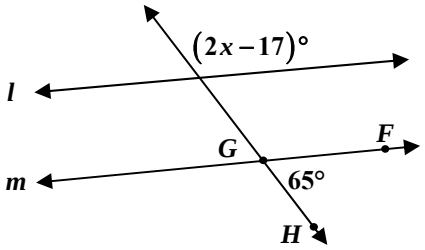
A. 180

B. 117

C. 63

D. 53

16. In the figure below, $m\angle FGH = 65°$.



What value of *x* would make line *l* parallel to line *m*?

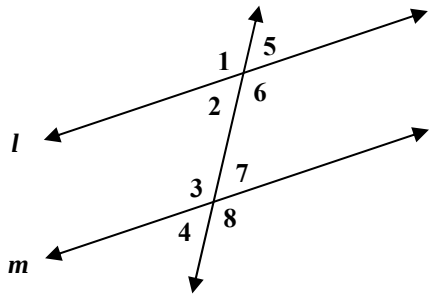
A. 41

B. 49

C. 65

D. 66

17. In the figure below, lines *l* and *m* are parallel.



Which statement is true?

A. $\angle 1$ and $\angle 3$ are congruent.

B. $\angle 1$ and $\angle 8$ are supplementary.

C. $\angle 2$ and $\angle 4$ are supplementary.

D. $\angle 6$ and $\angle 7$ are congruent.

18. Which is a valid classification for a triangle?

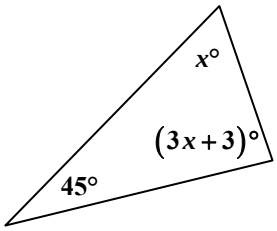
A. Acute right

B. Isosceles scalene

C. Isosceles right

D. Obtuse equiangular

19. Use the triangle below.



What is the value of *x*?

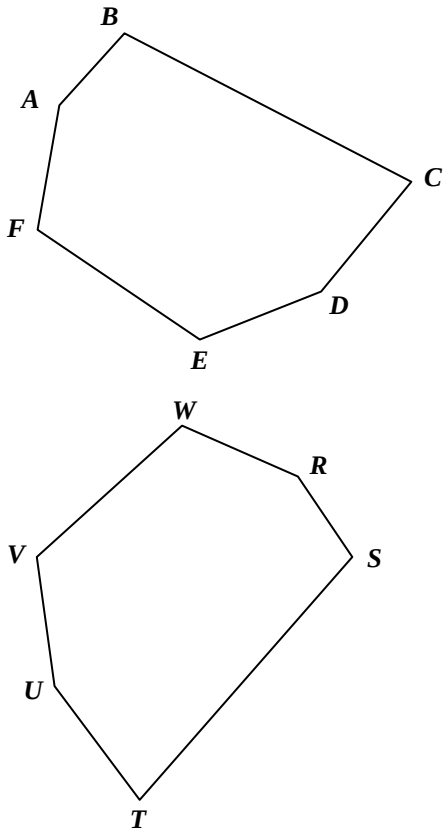
A. 29

B. 33

C. 44

D. 49

20. In the figures below, *ABCDEF* ≅ *RSTUVW* .



Which side of *RSTUVW* corresponds to $\overline{DE}$?

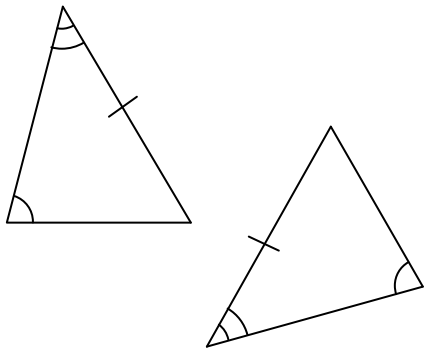
A. $\overline{RW}$

B. $\overline{SR}$

C. $\overline{UT}$

D. $\overline{UV}$

21. Use the triangles below.



Which congruence postulate or theorem would prove that these two triangles are congruent?

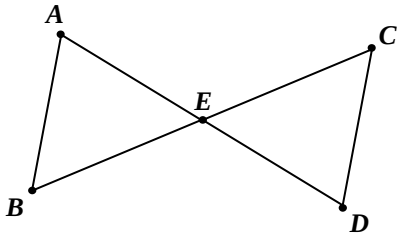
A. angle-angle-side

B. angle-side-angle

C. side-angle-side

D. side-side-side

22. In the diagram below, $\overline{AB} \cong \overline{DC}$ and $\overline{AB} \parallel \overline{DC}$.



Which congruence postulate or theorem would prove that these two triangles are congruent?

A. side-side-side

B. angle-angle-angle

C. side-angle-side

D. angle-side-angle

23. Given that $\Delta RST \cong \Delta XYZ$, $m\angle R = (6n+1)°$, $m\angle Y = 108°$, and $m\angle Z = (9n-4)°$, what is the value of n?

A. $\frac{5}{3}$

B. 5

C. $\frac{107}{6}$

D. $\frac{179}{6}$

24. Given that $\Delta PQR \cong \Delta JKL$, $PQ = 4x+12$, $JK = 7x-6$, $KL = 2x+17$, and $JL = 5x-7$, what is the value of x?

A. $2\frac{1}{2}$

B. 6

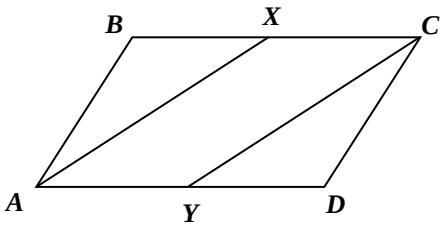
C. $12\frac{4}{7}$

D. 19

25. The statements for a proof are given below.

Given: Parallelogram $ABCD$
$\overline{BX} \cong \overline{DY}$

Prove: $\angle BAX \cong \angle YCD$



Proof:

STATEMENTS	REASONS
1. Parallelogram $ABCD$ $\overline{BX} \cong \overline{DY}$	1. Given
2. $\angle B \cong \angle D$	2.
3. $\overline{AB} \cong \overline{DC}$	3.
4. $\Delta ABX \cong \Delta CDY$	4.
5. $\angle 1 \cong \angle 2$	5.

What is the reason that the statement in Step 4 is true?

A. side-angle-side

B. angle-side-angle

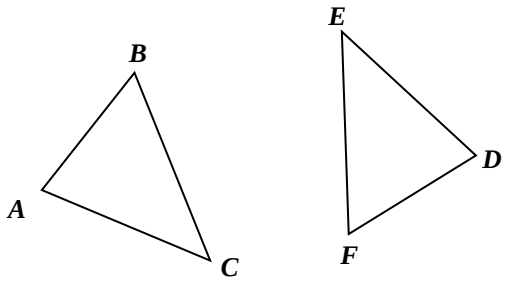
C. Opposite sides of a parallelogram are congruent.

D. Corresponding angles of congruent triangles are congruent.

26. The statements for a proof are given below.

Given: $\overline{AB} \cong \overline{FD}$
$\angle B \cong \angle D$
$\angle A \cong \angle F$

Prove: $\overline{BC} \cong \overline{DE}$



Proof:

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{FD}$	1. Given
2. $\angle B \cong \angle D$	2. Given
3. $\angle A \cong \angle F$	3. Given
4. $\Delta ABC \cong \Delta FDE$	4. _____
5. $\overline{BC} \cong \overline{DE}$	5. Corresponding Parts of Congruent Triangles are Congruent

What is the missing reason that would complete this proof?

A. side-side-side

B. side-angle-side

C. angle-side-angle

D. angle-angle-side

27. Given that $\Delta DEF \cong \Delta LMN$, $m\angle D = (2x+15)°$, $m\angle L = [3(x-2)]°$, and $DF = 4(x-17)$, what is LN?

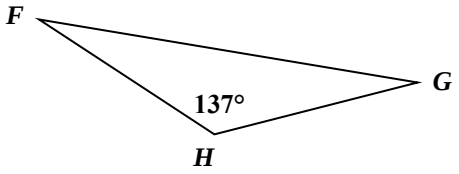
A. 16

B. 21

C. 57

D. 67

28. In the isosceles triangle below, $m\angle H = 137°$.



What is the measure of $\angle F$?

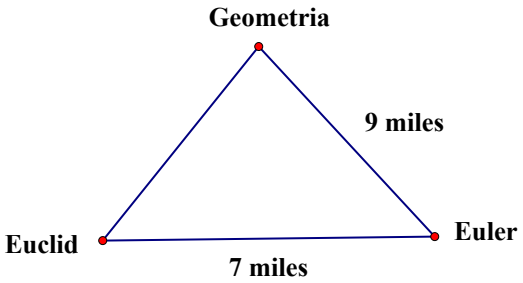
A. 21.5°

B. 26.5°

C. 43°

D. 53°

29. Three towns form a triangle on the map below.



Which statement does NOT represent possible distances between Euclid and Geometria?

A. Between 2 and 7 miles apart.

B. Between 7 and 9 miles apart.

C. Between 9 and 16 miles apart.

D. Between 49 and 81 miles apart.

30. The ΔRST is constructed with vertices $R(-5,2)$, $S(4,1)$, and $T(2,-1)$. What is the length of $\overline{ST}$?

A. $\sqrt{90}$

B. $\sqrt{58}$

C. $\sqrt{8}$

D. 2

31. In ΔABC, $\angle B$ is a right angle and $m\angle A = 40°$. Which list shows the sides in order from longest to shortest?

A. $\overline{AB}$, $\overline{BC}$, $\overline{AC}$

B. $\overline{BC}$, $\overline{AB}$, $\overline{AC}$

C. $\overline{AC}$, $\overline{BC}$, $\overline{AB}$

D. $\overline{AC}$, $\overline{AB}$, $\overline{BC}$

32. A triangle has two sides that have lengths of 7 cm and 17 cm. Which could represent the length of the third side of the triangle?

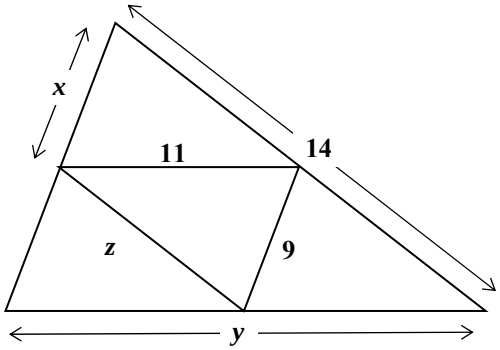
A. 24 cm

B. 18 cm

C. 10 cm

D. 7 cm

33. The triangle below contains three midsegments.



What are the values of *x*, *y*, and *z*?

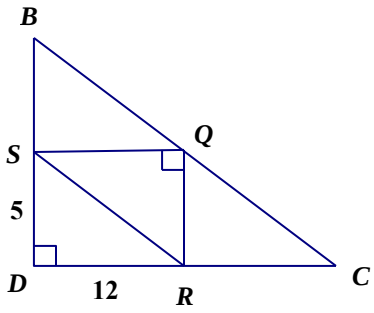
A. $x = 9, y = 22, z = 7$

B. $x = 9, y = 11, z = 14$

C. $x = 9, y = 22, z = 14$

D. $x = 18, y = 11, z = 7$

34. In ΔBCD, $\overline{SR}$ is a midsegment, and $\overline{SQ} \cong \overline{DC}$.



What is the length of $\overline{QC}$?

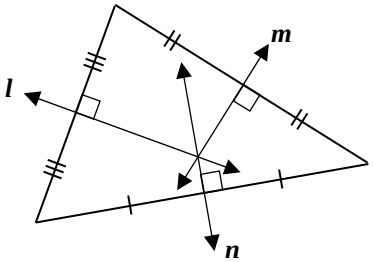
A. 34

B. 26

C. 17

D. 13

35. The triangle below shows a point of concurrency. Lines *l*, *m*, and *n*, are perpendicular bisectors of the triangle's sides.



What is the name of the point of concurrency in the triangle?

A. centroid

B. incenter

C. orthocenter

D. circumcenter

36. How many sides does a nonagon have?

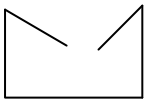
A. 7

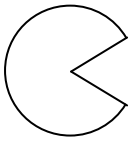
B. 9

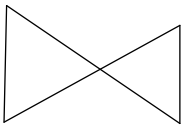
C. 11

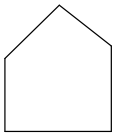
D. 19

37. Which figure is a polygon?

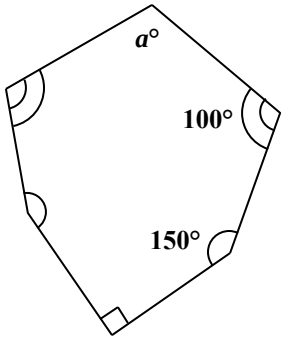
A. 

B. 

C. 

D. 

38. A hexagon is shown below.



What is the value of *a*?

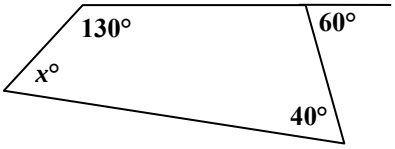
A. 90

B. 100

C. 130

D. 150

39. Use the figure below.



What is the value of *x*?

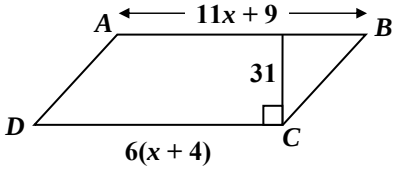
A. 70

B. 60

C. 50

D. 40

40. Parallelogram ABCD is given below.



What is the value of x?

A. 2

B. 3

C. 6

D. 16

41. What is the measure of each *exterior* angle of a regular hexagon?

A. 60°

B. 90°

C. 120°

D. 135°

42. Which statement is true about a kite?

A. A kite has 4 congruent sides.

B. A kite has 2 pairs of parallel sides.

C. A kite has perpendicular diagonals.

D. A kite has congruent diagonals.

43. Which statement below is true about an isosceles trapezoid?

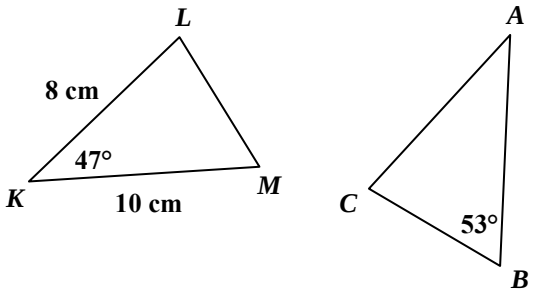
A. Both pairs of opposite sides are parallel.

B. Both pairs of opposite sides are congruent.

C. One pair of opposite sides is congruent and the other is parallel.

D. One pair of opposite sides is both parallel and congruent.

44. In the figure below, $\Delta KLM \cong \Delta ABC$.



Which statement must be true?

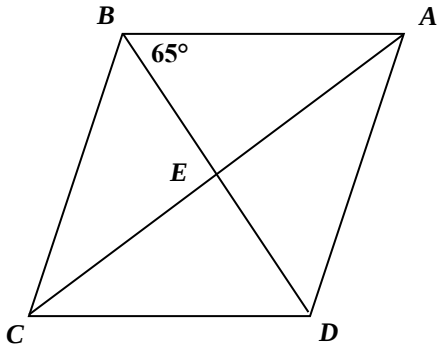
A. $AC = 8\,\text{cm}$

B. $BC = 6\,\text{cm}$

C. $m\angle A = 53°$

D. $m\angle C = 80°$

45. Use the rhombus below.



What is $m\angle CDE$?

A. 25°

B. 65°

C. 90°

D. 115°

46. A regular polygon has interior angles that measure 144°. How many sides does this polygon have?

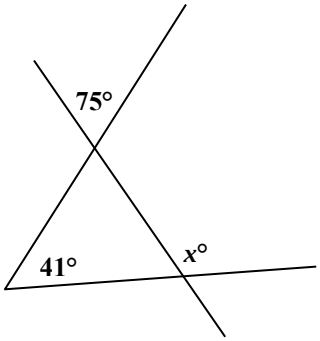
A. 6

B. 8

C. 10

D. 12

47. Use the figure below.



What is the value of x?

A. 64

B. 74

C. 116

D. 126

48. Given that ΔFGH is an isosceles right triangle, what is the measure of an acute angle of the triangle?

A. 45°

B. 60°

C. 90°

D. 120°

49. What is the n^{th} term of the sequence 1, 4, 9, 16, 25 …?

A. $2n-1$

B. $n+3$

C. n^2

D. $3n^2$

50. Geometric figures are displayed on a computer screen in the following order: triangle, concave quadrilateral, convex pentagon, concave hexagon. Using inductive reasoning, what prediction can be made about the next figure?

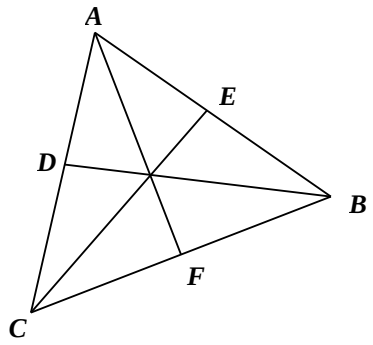
A. It will be a concave heptagon.

B. It will be a convex heptagon.

C. It will be a convex polygon, but the type cannot be predicted.

D. It will be a polygon, but no other details about it can be predicted.

51. Each angle of the large triangle is bisected in the figure below.



$m\angle CAF = 22°$

$m\angle ECA = 34°$

Which two small triangles are congruent?

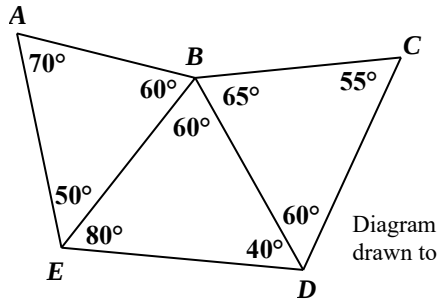
A. $\Delta ACE \cong \Delta BCE$

B. $\Delta AEC \cong \Delta AFB$

C. $\Delta BCD \cong \Delta BAD$

D. $\Delta BDA \cong \Delta CEA$

52. Use the dimensions given in the diagram below.



What is the shortest side in the diagram?

A. $\overline{AB}$

B. $\overline{BE}$

C. $\overline{BD}$

D. $\overline{CD}$

53. A circle has diameter $\overline{AB}$ with $A(4,-3)$ and $B(-11,-5)$. What is the center of the circle?

A. $\left(-\frac{15}{2}, -1\right)$

B. $\left(-\frac{7}{2}, -4\right)$

C. $\left(-\frac{7}{2}, -7\right)$

D. $\left(\frac{1}{2}, -8\right)$

54. ΔEFG has vertices $E(-2,-3)$, $F(3,7)$ and $G(6,-1)$. What is the length of $\overline{GE}$?

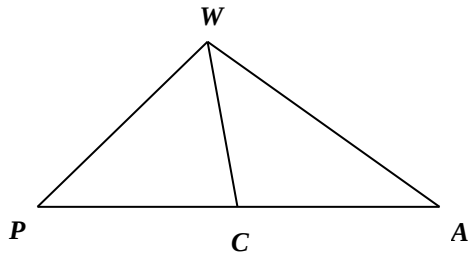
A. $\sqrt{73}$

B. $2\sqrt{17}$

C. $5\sqrt{5}$

D. $4\sqrt{2}$

55. Use the figure below.



Given: $\overline{WC}$ is not an altitude from $\angle PWA$ and $\overline{CP} \cong \overline{CA}$.
Prove: ΔPWA is scalene.

Which contradiction must you prove for an indirect proof?

A. $\overline{WC}$ is an altitude

B. $\overline{WC}$ is a perpendicular bisector

C. ΔPWA is scalene

D. ΔPWA is isosceles

56. What do you use as a given in an indirect proof?

A. Prove

B. Contradiction

C. CPCTC

D. Assumption

57. Given the points $W(-6,1)$, $X(-1,5)$, and $Y(6,0)$, which coordinates of Z would result in parallelogram $WXYZ$?

A. $(-1,3)$

B. $(-13,6)$

C. $(1,-4)$

D. $(11,4)$

58. The n^{th} term of a sequence is $3n^2$. The current term is 75. What is the next term?

A. 324

B. 225

C. 108

D. 100

59. In ΔABC, the length of side $\overline{AB}$ is 13 units. Given $A(-3,x)$ and $B(9,-2)$. Which is a value of x?

A. –7

B. –2

C. 7

D. 15

60. In isosceles ΔJKL, $\angle K$ is the vertex angle. If $m\angle J = 11x - 3$ and $m\angle L = 7(x+2) - 1$, what is $m\angle K$?

A. 4°

B. 41°

C. 82°

D. 98°

Geometry H Semester 1 Practice Exam
Free Response

1. Given: $(2x)(x+11) = 2(x-3)(x+7)$

Prove: $x = -3$

Supply reasons for each step.

2. Write step-by-step instructions on how to construct an angle whose measure is $2\frac{1}{4}$ times the measure of the original angle.

Do the construction.

3. Show that the quadrilateral *QUAD*, having vertices *Q*(–7,–6), *U*(7,1), *A*(1,3), and *D*(–5,0), is an isosceles trapezoid. (A blank coordinate grid is provided.)