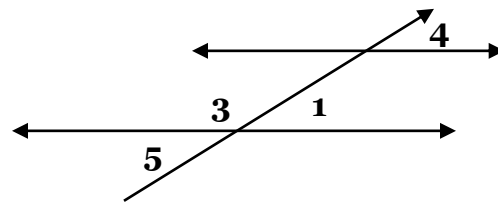


Show all work for credit. Attach paper as needed to keep work neat & organized.

1. Name the plane that contains the front of the house.
2. Name the intersection of the plane of the roof and the plane of the side of the house.
3. Name two planes that intersect in HS.

In the figures at right: $m\angle 1 = 45$, $m\angle 2 = 125$, $m\angle 3 = 135$, $m\angle 4 = 45$.
Determine whether the following is true or false.

4. $\angle 1$ and $\angle 4$ are supplementary.
5. $\angle 2$ and $\angle 4$ are supplementary.
6. $\angle 3$ is the supplement of $\angle 1$.
7. $\angle 1$ and $\angle 4$ are congruent and complementary.
8. $\angle 1$ and $\angle 3$ form a linear pair.



- 9: Name a set of: vertical angles _____ corresponding angles: _____
Alternate exterior angles: _____

Rewrite each statement in if-then form:

10. Every dog has long fur.
11. People who live in Iowa like corn.
12. Staff members are allowed in the faculty cafeteria.

Write the converse, inverse and contrapositive of the following; if possible write the bi-conditional. (Notice that this is a 3-4 part question!)

13. If a number is rational, then it is a real number.
14. If an angle is acute, then it has a measure less than 90 degrees.

Determine which of the following are statements:

15. What's your name?
16. Happy New Year
17. Five is an odd number.

Write the following using symbolic notation:

p = The sun is shining

q = It is raining.

r = the grass is green

18. If it is raining, then the sun is not shining.

19. It is raining and the grass is green.

20. The grass is green if and only if it is raining and the sun is shining.

Using the same phrases, write what the following mean:

21. $p \wedge \sim q$

22. $\sim p \rightarrow r$

23. $p \vee q$

Determine a valid conclusion that follows from each of the following and whether the Law of Detachment, Law of Syllogism or Law of Contrapositive was used. If false, state the error applied.

24. If you study hard, then you will be popular.

a) John studies hard.

b) John is popular

\therefore

by:

25. If one is a basketball star, then one is quick.

If one is quick, then one is a sprinter.

a) Enjoli is a basketball star.

b) Enjoli is not a sprinter.

\therefore

by

26. If I am broke, then I will ride the bus.

When I ride the bus, then I am late.

a) I am out of money.

b) I am not broke

\therefore

by

Determine whether the following arguments are valid OR invalid; if valid state which law is used.

27. If one is a professor, then one is a college graduate.

Sally is a college graduate.

Sally is a professor.

28. If one is a professor, then one is a college graduate.

Mr. Stuggles is a professor.

Mr. Stuggles is a college graduate.

29. If you score at least 90% , then you'll earn an A.

If you earn an A, then your parents will be proud.

Kelsee has proud parents.

Kelsee scored at least 90%.

Draw a diagram to solve the following:

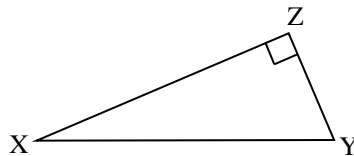
30. Betty, Cathy, Isabel, Lani, Alma and Ursula ran an 800m race. Alma beat Isabel by 7m. Betty finished 12m behind Ursula. Alma finished 5m ahead of Lani but 3m behind Ursula. Cathy finished halfway between the first and last person. In what order did they finish? Indicate the order and the distances between each girl.

31. A ball rebounds one-half the height from which it was dropped. The ball is dropped from a height of 160ft. and keeps on bouncing. What is the total vertical distance the ball will travel from the moment it is dropped to the moment it hits the ground for the fifth time?

32. Bob’s dad told Bob “If you score at least an 85% on your next geometry test, I’ll get you a new cell phone.” When Lulu saw Bob at school the next week, he had a new cell phone. Is Lulu correct to conclude that Bob must have scored at least 85% on his geometry test? Explain completely.

33. $m\angle X + m\angle Y$

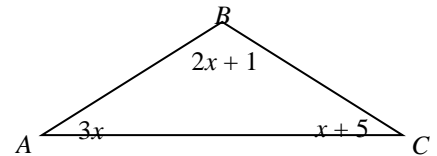
- A. 45°
- B. 90°
- C. 180°
- D. Cannot be Determined



34. While working on a team quiz, Anna, Bella, and Cortez came across the following problem:

Solve for x and then find the measure of each angle.

Bella quickly solved the problem and told her team “Hey! I got it! $m\angle A = 93^\circ$, $m\angle B = 63^\circ$, and $m\angle C = 36^\circ$. Done!”



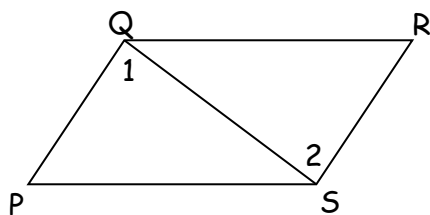
Anna and Cortez are suspicious. Does Bella have the correct answer, or are Anna and Cortez correct to be suspicious? Explain completely.

35. Which of the following can be lengths for a triangle?

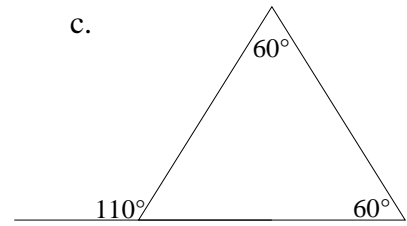
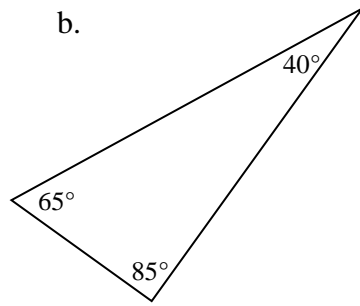
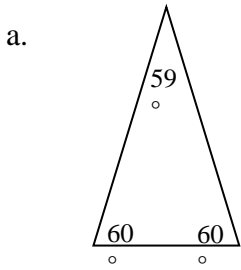
- I. 5, 6, 9
- II. 4, 8, 12
- III. 7, 8, 17

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I and III

36. If $\angle 1 \cong \angle 2$, which lines are parallel?

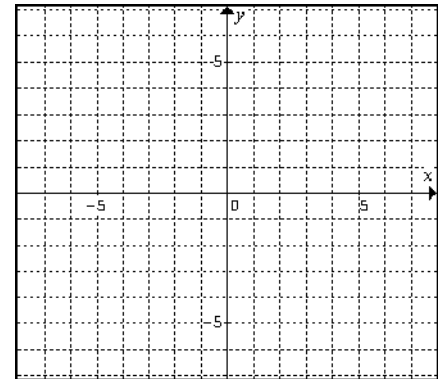


37. For each diagram below, explain what is wrong with each diagram.

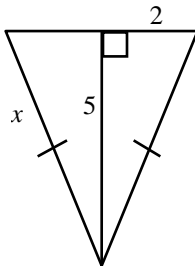


38. Graph the points $R(-2, 2)$, $A(-6, 2)$, $D(-4, 5)$.

- Translate triangle RAD down 8 and right 6. Label the new triangle with prime notation ($A \rightarrow A'$). Write a lower-case a inside the triangle.
- Rotate triangle RAD 90° clockwise (\curvearrowright) and label the image with prime notation ($A \rightarrow A''$). Write a lower-case b in the triangle.
- Reflect triangle RAD across the x -axis and label the image with prime notation ($A \rightarrow A'''$). Write a lower-case c in the triangle.



39. Solve for x . _____

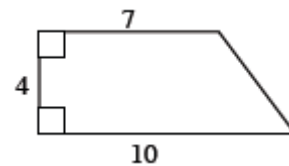
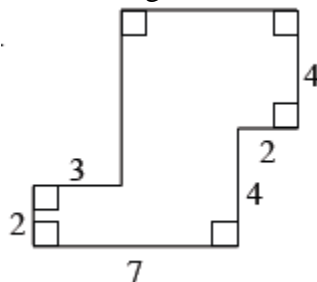
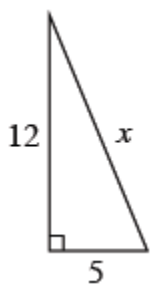


40. For each given set of numbers, determine if a triangle with those side lengths can be made or not. If a triangle can be made, determine if it is a right triangle. Justify your answer!

a. 8, 15, 17

b. 8, 12, 4

41. Find the perimeter and area of each figure.



42. Given isosceles triangle ABC with $AB = BC$. If $\angle A = 2x + 10$ and $\angle B = 6x - 20$, then $\angle C = ?$

- A. 18° B. 25° C. 46° D. 52° E. None of these

43. Write each as a conditional statement.

- All Polo shirts have a horse logo.
- A triangle is formed by three segments.
- Linear pairs are supplementary, adjacent angles.
- When you are eighteen you can vote.

44. A counter-example for the statement: "If a number is divisible by 3, then it is divisible by 6."

45. How many counter-examples are needed to prove a statement false?

46. Use the following: *If today is a good day, then I will ace my final.*

- Inverse
- Converse
- Contrapositive
- Bi-conditional

47. The definition of a parallelogram states: "If both pairs of opposite sides of a quadrilateral are parallel, then the quadrilateral is a parallelogram."

Quadrilateral BERT has both pairs of opposite sides parallel. What conclusion can you make? What type of reasoning did you use?

- | | |
|---------------------------------------|---------------------------------------|
| A] BERT is a parallelogram; inductive | B] BERT is a rectangle; deductive |
| C] BERT is a rectangle; inductive | D] BERT is a parallelogram; deductive |

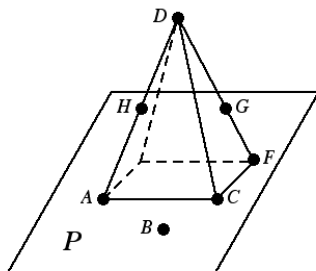
48. A certain triangle has exactly two congruent angles. Which of these conclusions must be true?

- | | |
|--------------------------------------|---|
| A] The triangle has no obtuse angles | B] Each congruent angle measures 60 degrees |
| C] The triangle is scalene | D] The triangle is isosceles |

49. Which statement below would have a reason of "REFLEXIVE PROPERTY" in a proof?

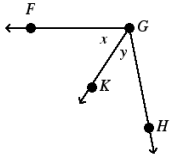
- A] $\overline{AB} \cong \overline{AB}$ B] \overline{AB} bisects $\angle CAR$ C] $\triangle ABC \cong \triangle CAR$ D] $\angle CAB \cong \angle BAR$

50. Use the diagram to answer the following:



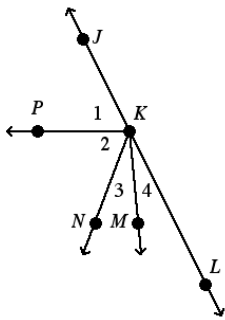
- a) Are H, G and B coplanar? _____ b) Are A, B, C, and F coplanar? _____
 c) Are D, G, F, and H coplanar? _____ d) Name a point NOT coplanar with H, A and D: _____
 e) Name $\overleftrightarrow{DH} \cup \overleftrightarrow{AC}$ _____ f) Name $\overleftrightarrow{DH} \cap \overleftrightarrow{AC}$ _____
 g) Name $\text{Plane } ABC \cap \text{Plane } DHC$ _____ h) Name $\overleftrightarrow{DH} \cap \overleftrightarrow{AH}$ _____
 i) Name $\overleftrightarrow{DF} \cap \overleftrightarrow{AC}$ _____
 j) Are D and B collinear? _____ k) Are A, F and C collinear? _____
 l) Are A, H and D collinear? _____ m) Which points lie on \overleftrightarrow{DG} _____
 n) Is $\angle ACF$ a right angle? _____ o) Is $\overleftrightarrow{CF} \perp \overleftrightarrow{AC}$? _____

51. In the figure, \overleftrightarrow{GK} bisects $\angle FGH$.

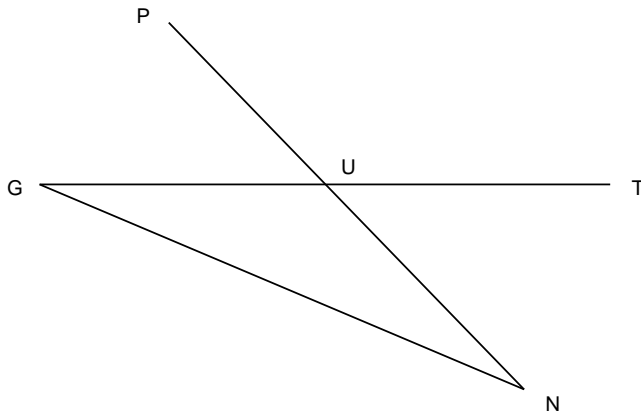


If $m\angle FGK = 3v - 4$ and $m\angle KGH = 2v + 7$, find x .

In the figure, \overleftrightarrow{KJ} and \overleftrightarrow{KL} are opposite rays. $\angle 1 \cong \angle 2$ and \overleftrightarrow{KM} bisects $\angle NKL$.



52. Which is NOT true about \overleftrightarrow{KM} ?
- $\angle MKJ$ is acute.
 - $\angle 3 \cong \angle MKL$
 - Point M lies in the interior of $\angle LKN$.
 - It is an angle bisector.
53. If $m\angle LKN = 7q + 2$ and $m\angle 4 = 4q - 5$, what is $m\angle 3$?
- 137
 - 4.2
 - 12
 - 43
54. Given point B is in the interior of $\angle ADC$.
 Conjecture: $\angle ADB \cong \angle BDC$
- False; $m\angle ADB$ may be obtuse.
 - True
 - False; just because it is in the interior does not mean it is on the bisecting line.
 - False; $m\angle ADB + m\angle BDC = 90$.



$$\angle GUN \cap \angle PUG =$$

$$\angle GUN \cap \angle PUT =$$

$$\overleftrightarrow{GU} \cap \overleftrightarrow{UG} =$$

$$\overleftrightarrow{GU} \cup \overleftrightarrow{UG} =$$

$$\overline{GU} \cup \overline{UT} =$$

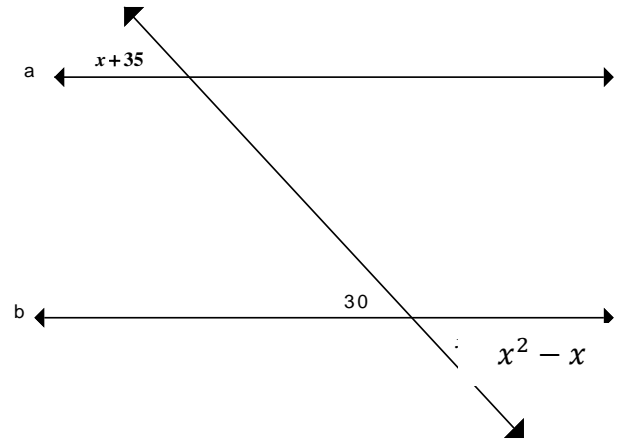
$$\overline{GU} \cap \overline{UT} =$$

$$\overrightarrow{UT} \cup \overrightarrow{UN} =$$

$$\overrightarrow{UT} \cap \overrightarrow{UN} =$$

$$\overrightarrow{UT} \cap \overrightarrow{TU} =$$

56. Is line a parallel to line b? Justify your answer:



57. Answer the following true/false questions. For each false you should be able to provide a counter-example.

- | | |
|--|--------|
| a. $T(x, y) \rightarrow (x+3, y)$ is a transformation. | T or F |
| b. All mappings are transformations. | T or F |
| c. All transformations are mappings. | T or F |
| d. When $x = 3$, $f(x) = 3x+1$ is equal to 10. $x = 3$ is the input. | T or F |
| e. $T(x, y) \rightarrow (x, y+5)$ is an isometric transformation. | T or F |
| f. $T(x, y) \rightarrow (2x, 2y)$ is an isometric transformation. | T or F |
| g. $T(x, y) \rightarrow (x+\sqrt{5}, -y)$ is an isometric transformation. | T or F |
| h. $T(x, y) \rightarrow (3x, y+2)$ is an isometric transformation. | T or F |
| i. The maximum lines of symmetry of a n sided polygon is n . | T or F |
| j. A rectangle has only 2 lines of symmetry. | T or F |
| k. A regular hexagon has 5 lines of symmetry. | T or F |
| l. Line symmetry and Reflectional symmetry are the same types of symmetry. | T or F |
| m. The maximum number of lines of symmetry of a polygon is always found in its regular form. | T or F |
| n. If a shape has a rotational order of 1, then it has NO rotational symmetry. | T or F |
| o. A rotational symmetry of order 2 means that the angle of the order is 90° . | T or F |
| p. \overline{AB} is reflected to $\overline{A'B'}$, then $AA' = BB'$. | T or F |

- q. If point A is 2.5 cm from the line of reflection, then $AA' = 5$ cm. T or F
- r. If line m is the perpendicular bisector of \overline{GH} , then $R_{line\ m}(G) = H$ T or F
- s. A rotation of 180° reverses the orientation of the shape. T or F
- t. If \overline{MN} is reflected to $\overline{M'N'}$, then $MN = M'N'$. T or F
- u. A positive rotation is in the counter clockwise direction. T or F
- v. When a rotation of 80° about point T is performed, all points in the plane move. T or F
- w. If a translation maps A (-3,5) to A' (3, 5), then $T(x,y) \rightarrow (x - 6,y)$ would be the rule. T or F
- x. If the translation $T(x,y) \rightarrow (x + 3, y - 2)$ produced image A' (-1,4), then A (2, 2). T or F
- z. $G(x,y) \rightarrow (-x,y)$ is a reflection over the x axis. T or F
- aa. $R(x,y) \rightarrow (-x,-y)$ is a reflection over the $y = x$ axis. T or F
- bb. $F(x,y) \rightarrow (x + 3,y)$ is a translation of 3 units to the right. T or F
- cc. $W(x,y) \rightarrow (x - 5, 2y)$ is a translation. T or F
- dd. A double reflection could either be described as a single translation or a rotation. T or F
- ee. In doing composite transformations the order that you do them in doesn't matter. T or F