

Determine whether each conjecture is true or false. Provide a counterexample for any *false* conjecture.

- 1) Given:  $m\angle A = m\angle B$  1) TRUE FALSE

Conjecture:  $\angle A$  and  $\angle B$  are vertical angles.

Counterexample (if FALSE): \_\_\_\_\_

- 2) Given:  $AM = MB$  2) TRUE FALSE

Conjecture:  $M$  is the midpoint of  $\overline{AB}$

Counterexample (if FALSE): \_\_\_\_\_

Use the following conditional statement for questions 3 – 5.

**Right angles are congruent.**

- 3) Write the statement in If-then form: \_\_\_\_\_  
\_\_\_\_\_

- 4) Write the hypothesis and conclusion.  
Hypothesis: \_\_\_\_\_  
Conclusion: \_\_\_\_\_

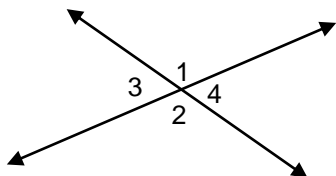
- 5) Write the converse of question 3: \_\_\_\_\_  
\_\_\_\_\_

- 6) Write the inverse of question 3: \_\_\_\_\_  
\_\_\_\_\_

- 7) Write the contrapositive of question 3: \_\_\_\_\_  
\_\_\_\_\_

- 8) Is the converse of question 3 TRUE? If not, please provide a counterexample: \_\_\_\_\_  
\_\_\_\_\_

Use the following picture for questions 9 -12.



9) If  $m\angle 1 = 6x - 5$  and  $m\angle 2 = 5x + 23$ , find the value of  $x$ .

9) \_\_\_\_\_

10) Based on #9, find the  $m\angle 1$  and  $m\angle 2$ .

10)  $m\angle 1 =$  \_\_\_\_\_

$m\angle 2 =$  \_\_\_\_\_

11) If  $m\angle 1 = 4y - 7$  and  $m\angle 3 = 2y + 7$ , find the value of  $y$ .

11) \_\_\_\_\_

12) Based on #11, find the  $m\angle 3$  and  $m\angle 4$ .

12)  $m\angle 3 =$  \_\_\_\_\_

$m\angle 4 =$  \_\_\_\_\_

---

13) If  $A$  is the midpoint of  $XY$ ,  $XA = 5y - 10$  and  $AY = 2y + 5$ , find  $XY$ . (HINT: Draw a diagram)

13) \_\_\_\_\_

14) Given that  $\overrightarrow{SH}$  bisects  $\angle KSL$ ,  $m\angle KSH = 4x - 20$ , and  $m\angle LSH = 2x$ . Find the measure of  $\angle KSH$ . (HINT: Draw a diagram)

14) \_\_\_\_\_

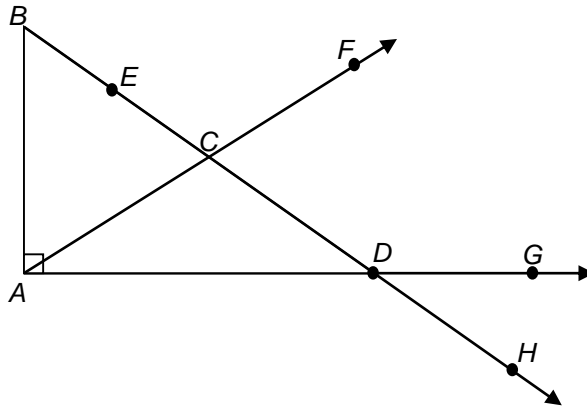
Write whether each statement is TRUE or FALSE.

- |   |         |
|---|---------|
| 15) Right angles are congruent.                                     | 15) T F |
| 16) If two angles are adjacent angles, then they are complementary. | 16) T F |
| 17) Two angles that are supplementary are congruent.                | 17) T F |

Fill in the blank with the correct word(s).

- |  |           |
|--|-----------|
| 18) A _____ is an educated guess based on known information.   | 18) _____ |
| 19) A pair of angles that have a common side and common vertex, but do not have any common interior points are called _____. | 19) _____ |
| 20) The statement immediately following the word “then” in an If-then statement is called the _____.                         | 20) _____ |

Use the diagram below to answer questions 21 – 25.



- |  |           |
|--|-----------|
| 21) Name a pair of complementary angles. | 21) _____ |
| 22) Name a pair of vertical angles.      | 22) _____ |
| 23) Name a linear pair.                  | 23) _____ |
| 24) Name the vertex of $\angle DCA$ .    | 24) _____ |
| 25) Name the sides of $\angle GDH$ .     | 25) _____ |

Consider the following statement for the problems below:

**If someone drinks and drives, then s/he is at risk of causing an accident.**

- 26) Create (2) additional statements that together with the statement above, exemplify the *Law of Detachment*.

(1) \_\_\_\_\_.

(2) \_\_\_\_\_.

- 27) Create (2) additional statements that together with the statement above, exemplify the *Law of Syllogism*.

(1) \_\_\_\_\_.

\_\_\_\_\_.

(2) \_\_\_\_\_.

\_\_\_\_\_.