**Unit 2 - Some Review Problems**

1. Given: bisects MQP

Based on the figure on your answer sheet with the given information, which conclusion **cannot** be proven?

|  |  |
| --- | --- |
| A. | m1 = m2 |
| B. | mLQN = 135° |
| C. | mMQL = mPQM |
| D. |  |

 2. A square window 1 pane wide by 1 pane high is comprised of 1 piece of glass. A square window 2 panes wide by 2 panes high is comprised of 4 pieces of glass. What formula can be used to determine how many panes wide a square window is that is comprised of 289 pieces of glass?

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **n = the number of panes** | 1 | 2 | 3 | 4 | 5 | . . . . .  | **nth term** |
| **f(n) = how many pieces of glass** |  |  |  |  |  | . . . . .  |  |

3. For which of the following conditional statements is the contrapositive true?

I. If an angle is acute, then it measures less than 90°

II. If two angles are vertical angles, then they are congruent

III. If two angles are supplementary, then their sum is 180°.

|  |  |
| --- | --- |
| A. | I and II only |
| B. | II and III only |
| C. |  I and III only |
| D. | I, II, and III |

4. Write each of the following, and then determine whether the new statement is true or false. If it is false, find a counterexample:

a) CONVERSE of “*If you have a dog, then you are a pet owner”*

*b)* INVERSE of ““If you are an adult United States citizen, then you can join the armed forces”?

5. Make a conjecture about the next item in each sequence.

a) -1/2, 1/4, -1/8, 1/16

b) 

6. Based on the pattern in the table, how many segments would be determined by a line containing 12 points?

 **n f(n)**



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **n** | 2 | 3 | 4 | 5 | 6 | . . . . .  | **12** |
| **f(n)** |  |  |  |  |  | . . . . .  |  |

|  |  |
| --- | --- |
| A. | 12 |
| B. | 24 |
| C. | 30 |
| D. | 66 |

7. Use deductive reasoning to determine which statement is true based on the following information.

* Marie, Parker, Nancy, and Jerry are teachers at the same high school, each teaching a different subject.
* The teachers teach either Math, Music, History, or Art.
* Parker uses calculators for his classes and no one else does.
* Marie’s room is next door to the History teacher’s room.
* Nancy and the art teacher carpool together driving to work.
* The music teacher and the history teacher have coffee each morning with Jerry.

|  |  |
| --- | --- |
| A. | Marie teaches History |
| B. | Nancy teaches Math |
| C. | Parker teaches Music |
| D. | Jerry teaches Art |

*8. Determine whether the conjecture is* true *or* false*. Give a counterexample for any false conjecture.*

 **Given:** Two angles are supplementary

 **Conjecture:** They are both acute angles.

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| --- | --- |
| A. | False; either both are right or they are adjacent. |
| B. | True |
| C. | False; either both are right or one is obtuse. |
| D. | False; they must be vertical angles. |

9. Which of the following definitions or theorems **cannot** be used to prove that two lines are perpendicular?

|  |  |
| --- | --- |
| F. | If two lines intersect to form congruent adjacent angles, then the lines are perpendicular. |
| G. | If two lines intersect and form a right angle, then the lines are perpendicular. |
| H. | If two lines intersect and form a linear pair, then the lines are perpendicular. |
| J. | If two lines intersect and form four congruent angles, then the lines are perpendicular. |

10. Complete an algebraic proof to solve the following equation: 

11. Complete the following geometric proofs.

Please do the proofs on a separate sheet of paper!!

a) GIVEN: FG = HJ

 PROVE: FH=GJ

b) GIVEN: 

 PROVE: 

12. Write a biconditional statement for the following conditional statement.

 *If a polygon is regular, then it is equilateral and equiangular.*

13. Determine whether each conclusion (third statement) is VALID or INVALID from the 1st 2 statements.

a) If you finish your homework by 5:00 p.m., then you go out to dinner.

 b) You finish your homework by 3:30p.m.

c) You go out to dinner.

a) If blue ray players are on sale for under $100, then you buy one.

 b) You buy a blue ray player.

c) Blue ray players are on sale for under $100.

14. Write the conclusion that can be formed from the following:

 *If an angle is supplementary to an obtuse angle, then it is acute.*

 *If an angle is acute, then its measure is less than 90 degrees.*

15. Solve for each variable.

(x2)°

(2x + 117)°

(7x + 4y)°

97°

(5x + 4y)°

