

GEOMETRY

Exam 2

Based on Chapter 2 (pages 70 - 139) in your textbook.

Student's Name _____ Student Number _____

Street _____ City _____ State _____ Zip Code _____

BE SURE YOU FULLY UNDERSTAND ALL CHECKPOINT PROBLEMS FROM THIS CHAPTER BEFORE YOU COMPLETE THIS EXAM. **SHOW AS MUCH WORK AS POSSIBLE.**

1. Describe the pattern in the numbers and write the next two numbers.

0.0625, 0.125, 0.25, _____, _____

2. The table below relates the number of non-collinear points in a figure with the total ways to connect the points. Finish the example picture for 5 points and draw a picture for 6 points. *Pictures of 7 points and 8 points are optional.* Finish the table for number of connections between 5, 6, 7, and 8 points.

Number of Points	1	2	3	4	5	6	7	8
Example Picture								
Number of Connections	0	1	3	6				

Items 3-4: Indicate whether the conjecture is true or false.
If false, provide a counterexample.

3. $\sqrt{x^2} = |x|$

4. If $\frac{a}{b} > 0$, then $a > 0$ and $b > 0$.

5. Write the if-then form, hypothesis, conclusion, converse, inverse, and contrapositive for the following statement:

Statement: Vertical angles have equal measure. *Hint: See Theorem 2.6*

If-then Form: If two angles are vertical, then they have equal measure.

Hypothesis: _____

Conclusion: _____

Converse: _____

T F

Inverse: _____

T F

Contrapositive: _____

T F

6. Indicate whether the converse, inverse, and contrapositive in item 5 are true or false by circling T or F above.

7. Is the original statement in item 5 a valid definition? Explain why or why not.

8. Write the following statement as a biconditional.
If a triangle is equilateral, then the triangle is equiangular.

(more)

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Items 9-11: If Statement (3) follows from Statements (1) and (2) by the Law of Detachment or Law of Syllogism, then circle the law that was used. Otherwise, circle the word "invalid."

9. (1) If Janet finishes her homework, then she will get to watch TV.
(2) Janet finished her homework.
(3) Janet gets to watch TV.
- Law of Detachment Law of Syllogism Invalid*

10. (1) If Janet finishes her homework, then she will watch TV.
(2) If Janet watches TV, then she will eat pretzels.
(3) If Janet finishes her homework, then she will eat pretzels.
- Law of Detachment Law of Syllogism Invalid*

11. (1) If Janet watches TV, then she will eat pretzels.
(2) Janet ate some pretzels.
(3) Janet got to watch TV.
- Law of Detachment Law of Syllogism Invalid*

12. Correct the error in Statement (3) by rewriting it so it follows from Statements (1) and (2).
(1) If Janet finishes her homework, then she will watch TV.
(2) If Janet watches TV, then she will eat pretzels.
(3) If Janet ate pretzels, then she finished her homework.

(3) _____

Items 13-15: Circle the type of reasoning used.
Circle "Invalid" if the conclusion is not true.

13. Cory knows that David is shorter than Jennifer.
Cory also knows he is taller than Jennifer.
Cory reasons he is taller than David.
Inductive Deductive Invalid
14. Cory is told that when Jennifer gets her chores done, then she will usually go to the mall.
He also knows that Jennifer usually gets her chores done by 5 p.m.
Cory reasons that Jennifer will usually go to the mall by 5 p.m.
Inductive Deductive Invalid
15. David plays video games if and only if he finishes his homework.
David did not play video games on Wednesday.
Therefore David did not finish his homework on Wednesday.
Inductive Deductive Invalid

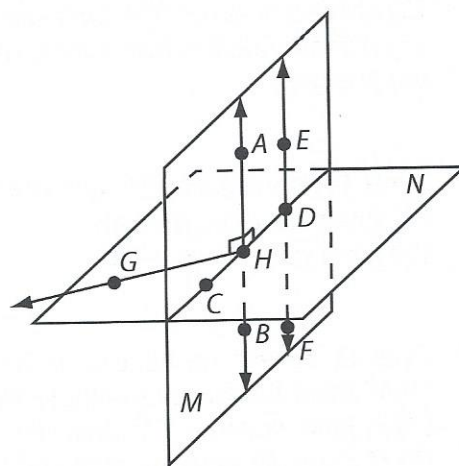
(over)

Items 16-19: Complete the following statements by writing the missing word(s).

16. If two lines intersect, then their intersection is exactly _____.
17. _____ line can be drawn through two points.
18. If two planes intersect, then their intersection is _____.
19. Through any three non-collinear points there exists exactly _____.

Items 20-25: Circle yes or no to indicate if each statement can be assumed from the diagram.

20. Yes No $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$?
21. Yes No $\overleftrightarrow{EF}$ and $\overleftrightarrow{CD}$ intersect at point H ?
22. Yes No Points D , E , and F are collinear?
23. Yes No Points G , B , and E lie in a plane not shown on the diagram?
24. Yes No Plane M intersects plane N in $\overleftrightarrow{CD}$?
25. Yes No $\overleftrightarrow{AB} \perp$ plane N ?



26. Complete the following solution by filling in the missing statements and reasons.

Statements	Reasons
$x - 2(3x - 4) = 18$	Given
_____	Distributive Property
$-5x + 8 = 18$	Simplify
_____	_____
$x = -2$	_____

(more)

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Items 27-29: Name the property of equality each statement illustrates.

27. If $m\angle 2 = m\angle 3$ and $m\angle 3 = m\angle 1$, then $m\angle 2 = m\angle 1$. _____

28. If $AC = AB + BC$, then $AB + BC = AC$. _____

29. $m\angle ABC = m\angle ABC$ _____

Items 30-37: In the diagram below $AC = BD$. Fill in the reasons to show $\overline{CD} \cong \overline{AB}$.

Given: $AC = BD$
Prove: $\overline{CD} \cong \overline{AB}$



Statements	Reasons
30. $AC = BD$	30. _____
31. $AC = AB + BC$	31. _____
32. $AB + BC = BD$	32. _____
33. $BD = BC + CD$	33. _____
34. $AB + BC = BC + CD$	34. _____
35. $AB = CD$	35. _____
36. $CD = AB$	36. _____
37. $\overline{CD} \cong \overline{AB}$	37. _____

Items 38-39: Indicate whether the statement is true or false by circling the appropriate letter.

38. T F A theorem is a statement that can be proven using definitions, properties, postulates, and previously proven theorems.

39. T F Unlike a theorem, a postulate is a rule that is accepted without proof.

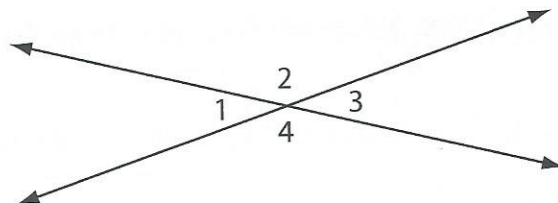
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40. In the figure on the right, if $m\angle 1 = 32^\circ$, then find the following:

$m\angle 2 =$ _____

$m\angle 3 =$ _____

$m\angle 4 =$ _____

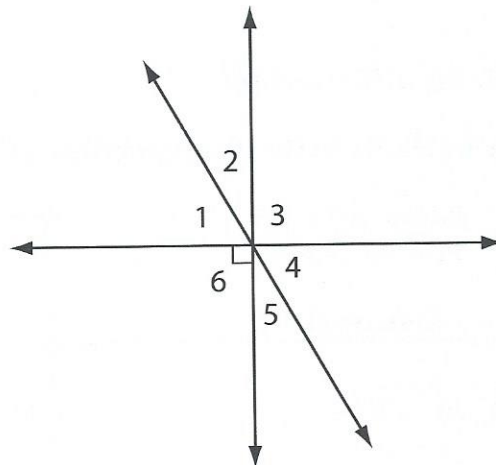


Items 41-45: Use the figure on the right.

41. Name a pair of vertical angles.

42. Name a pair of complementary angles.

43. Name a pair of supplementary angles.



44. Given $\angle 1 \cong \angle 2$, finish the proof that $m\angle 1 = m\angle 5$.

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. _____
2. $\angle 2 \cong \angle 5$	2. _____
3. _____	3. Transitive Property of Angle Congruence
4. $m\angle 1 = m\angle 5$	4. _____

45. If $m\angle 1 = 60^\circ$, then $m\angle 3 + m\angle 5 =$ _____.

FILL IN YOUR NAME AND THE OTHER REQUIRED INFORMATION ON EACH PAGE OF THE EXAM AND MAIL THE EXAM TO AMERICAN SCHOOL.