Mid-Chapter 2 Review

Name _____

LT 1: (Inductive Reasoning) Write a conjecture. Then find the next term in the sequence.

1. 3, 6, 9, 12, 15,... 2. $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, ...$



LT 2: (Counterexamples) Find a counterexample to show that each conjecture is false.

- 5. If n is a prime number, then n + 1 is not prime.
- 6. If you have three points D, C, E, then D, C, and E are noncollinear.

- 7. If x is an integer, then -x is positive.
- 8. If the area of a rectangle is 20 m², then the length is 10 m and the width is 2 m.

LT 3: (Compound Statements) Use the following statements to write a compound statement. Then determine the truth value of the statement. Explain your reasoning.

- p: the figure is a triangle
- q: the figure has two congruent sides
- r: the figure has three acute angles



9. q ^ r

10. pvr

Create and complete a truth table for the following compound statements.

13. p v (~q ^ r) 14. q ^ ~ r

LT 4: (Venn Diagrams) Use the Venn diagrams below to answer the following questions.

- 15. The diagram shows how people like their coffee.
 - a. How many people like both sugar and cream?
 - b. How many people like either cream or sugar?



- 16. The diagram shows a survey of 180 students' favorite subject. The students in group A like math. Students in group B like science. Students in group C like language arts.
 - a. How many students like all three classes?
 - b. How many students like science?
 - c. How many students who like math also like language arts?



LT 5: (Conditional Statements) Identify the hypothesis and conclusion of each statement.

- 17. If a group of kids is chatty, then they won't get their homework done.
- 18. If a number is divisible by 10, then it's last digit is a 0.
- 19. Another performance will be scheduled if the first one is sold out. (Change to an if-then first).

- 20. Determine the truth value of each conditional statement. If it is true, explain your reasoning. If it is false, give a counterexample.
 - a. If you divide an integer by another integer, then the result is an integer.
 - b. If the next month is August, then this month is July.
 - c. If a triangle has four sides, then it is concave.

LT 6: (Deductive Reasoning) Use the Law of Detachment and the Law of Syllogisms to determine if a statement is valid or invalid. <u>Explain your reasoning.</u>

21. Given: If three points are noncollinear, then they determine a plane. Points A, B, and C lie in plane G.

Conclusion: Points A, B, and C are noncollinear.

22. Given: If a student turns in a permission slip, then the student can go on the field trip. Felipe turned in his permission slip.

Conclusion: Felipe can go on the field trip.

23. Use the Law of Syllogisms to draw a valid conclusion from each set of statements.

a. If you are an actor, then you enjoy theater productions. If you like theater productions, then you like musicals.

Valid Conclusion:

b. If two lines in a plane are not parallel, then they intersect. If two lines intersect, then they intersect in a point.

Valid Conclusion: