Math 211 - Exam 2 Review

1. Use set operations to name the shaded region.

   a. 
   
   ![Venn Diagram](image)

   b. 
   
   ![Venn Diagram](image)

2. Suppose the universal set contains 70 elements, set A contains 30 elements, set B contains 25 elements, and there are 12 elements in the intersection of sets A and B. Determine how many elements are in the following sets:
   a. \( A \cup B \)
   b. The shaded region of 1a.
   c. The shaded region of 1b.

3. Use Venn diagrams to solve the following:
   a. During one ocean cruise it rained on 12 days. Whenever it rained in the morning, the afternoon was clear, and whenever it rained in the afternoon, the morning was clear. There were 9 clear mornings and 11 clear afternoons. How many days were clear all day?

   b. Of the visitors to the zoo on Wednesday, 350 saw the monkeys, 270 saw the lions, and 410 saw the elephants. If 250 people saw all three of these animals and 20 people saw only the lions and the elephants, how many people saw only the monkeys and the lions?

4. If a number is not divisible by 3, can it be divisible by 6? Explain.

5. If a number is not divisible by 6, can it be divisible by 3? Explain.

6. Explain why the divisibility rule for 4 works (include an illustration in your explanation).

7. Explain how LCM can be used to help determine which size is the best bargain if Sudsy dish detergent is sold in these sizes of containers: 8 oz for $0.45
   10 oz for $0.55
   12 oz for $0.65

8. Explain why square numbers have an odd number of factors.

9. Give an example of a number that has exactly three factors.
10. Give a precise description of the types of numbers that will have exactly three factors.

11. Illustrate the GCF(30, 36) and LCM(30, 36) using:
   a. Linear models
   b. Rectangular models
   c. Venn diagrams

12. You are going to sort your gumballs into piles. You have 210 yellow gumballs and 294 blue gumballs. You want each pile to have only one color of gumball. There must be the same number of gumballs in each pile and each pile must have the largest possible number of gumballs. How many gumballs will be in each pile? Explain your solution visually and procedurally (symbolically).

13. Write a word problem for 40 ÷ 8 that uses each of the following concepts of division. Solve each problem. Clearly illustrate (visually) your solution and explain verbally why the problem represents the respective division concept.
   a. Measurement concept
   b. Partitive (sharing) concept

14. Supply a verbal, concrete and symbolic representation for each step of the division problem 465 ÷ 13 (column format preferred) from a:
   a. Measurement perspective
   b. Partitive (sharing) perspective