Sample Questions for Final Exam

1. How many license plates with 3 letters followed by 3 numbers can be made if no letters or numbers are repeated?

2. A certain lottery has you select 6 integers from 1 to 40. You will win if the numbers you choose are drawn in any order. How many different lottery tickets are there in this game?

3. Let \( A = \{2, 4, 5\} \) and \( B = \{3, 4, 5, 6\} \).
   (a) What is \( n(A \cap B) \)?
   (b) What is \( n(A \cup B) \)?
   (c) What is \( n(A \cap B') \)?
   (d) What is \( n(A \times B) \)?
   (e) Sketch a Venn Diagram to illustrate \( A \cap B \).

4. An investor hopes to increase his retirement account to $800,000 by the time he retires 15 years from now. The present value of the account is $65,000. He expects his investment to earn an annual rate of 9.9%, compounded monthly. What must his monthly payment be to reach his goal?

5. Estimate the balance on a credit card after 4 years if the initial balance is $1500, the interest rate is 15.9% compounded monthly, and the cardholder makes minimum monthly payments of 2.5% of the balance.

6. You take out a car loan for $14,000 over 6 years at 3.9% financing. What are your monthly payments going to be?

7. You start a savings account with $500. It earns 4.1% annual interest. Find out your balance after 3 years if the interest is (a) simple, (b) compounded quarterly, or (c) compounded daily.

8. Solve for \( x \) if \( 4^x = 7(3^x) \).

Also review the sample questions for Exam #1 and Exam #2.