Name: _____ Pre-Calculus: Chapter 16 Review

Show all work on a separate sheet of paper. Leave all answers in simplest fractional form unless specified.

1. One card is selected from a standard deck of card.
   a. What is the probability that the card is a heart or a face card? (Ace is not a face card)
   b. What is P(J | B)? (the probability that the card is a jack, given a black card)
   c. What is P(B | J)? (the probability that the card is black, given a jack)
   d. What is P(D∩F)? (the probability that the card is a diamond and a face card, Ace is not a face card)
   e. What is P(x < 7)? (the probability that the card is a 6 or less? Ace is 1)

2. A bag contains 3 red marbles, 4 yellow marbles, and 5 blue marbles. Two marbles are selected from the bag without replacement.
   a. Draw a tree diagram listing all possibilities and the given probabilities.
   b. Find $P(Y \mid R)$
   c. Find $P(R \mid B)$
   d. Find $P(YY)$.
   e. Find $P(BY)$.

3. If four cards are drawn from two well shuffled standard decks without replacement, find the probability of drawing:
   a. 4 diamonds
   b. 0 Aces

4. A quiz has 8 multiple-choice questions, each with 5 choices. If you randomly guess at every questions, what is the probability of getting:
   a. At least 6 questions correct?
   b. All eight questions correct?
   c. At least 1 question correct?

5. A bag contains 3 green marbles, 5 pink marbles, and 7 purple marbles. A marble is drawn at random from the bag. What is the probability that:
   a. It is purple? b. It is not pink? c. It is yellow?

   d. What are the odds of drawing a pink marble? e. What are the odds of not drawing a green marble?

6. A die is rolled and a coin is tossed. List the sample space.

7. The probability of Mr. Scevola waking up on time any one of the 5 school days is 65%.
   a. What is the probability of waking up on time at least 3 days in a school week? (Leave answer in decimal form)
   b. What is the probability of not waking up at least three days in a school week? (Leave answer in decimal form)

8. If the probability that a child is a son is 0.4, find the probability that in a family of four children, there are:

   a. Exactly two daughters. b. All sons. c At least two sons.

9. If a coin is tossed 5 times, what is the probability:
   a. Of tossing exactly 3 heads? b. Of tossing at least 4 tails?

10. Expand out $(2y^2-3)^4$.

11. Find the coefficient of y^4 in $(3y+2)^{10}$.

12. In class of 28 people, there are 16 girls and 6 lacrosse players. Of the lacrosse players, 4 are girls.
   a. Draw a Venn Diagram of the situation.

   b. If a student is randomly selected, find P(G).
   c. If a student is randomly selected, find P(L | B).
   d. If a student is randomly selected, find P(B | L).
   e. If a student is randomly selected, find the P(B | G).
   f. If a student is randomly selected, find the P(BG).

13. Decide if the events are independent or not.
   Definition: Two events, A and B, are **independent** if the fact that A occurs does not affect the probability of B occurring.
   a. Rolling two 1's on your first roll of dice and rolling two 1's on your second roll.
   b. Picking an Ace on your first pick then picking an Ace on your second pick without replacing the first card.
   c. Getting a 13 on your first spin of a roulette wheel and getting a 13 on your second spin of a roulette wheel.
   d. The event the first computer you select from a group of 20 computers is defective vs the second one you select is defective if you know there are exactly three defective computers.

14. A Canadian license plate is 3 letters followed by 3 digits. What is the probability that:
   a. Your plate is three evens, followed by three letters.
   b. Your plate is 123ABC
   c. Your plate is ABC123
   d. Your plate has at least one D.