Give answers as fractions in simplest form, unless otherwise requested.

For questions 1 and 2: a jar contains 12 red marbles, 16 blue marbles, and 18 white marbles.

1. Marbles are selected at random, one at a time. Find the probability of choosing these marbles:

a) red, then blue, with replacement

b) red, then blue, without replacement

c) red, then red, then white, with replacement

d) red, then red, then white, without replacement

2. Marbles are selected 3 at a time. Find the probability of choosing:

a) all blue marbles   b) exactly 1 red marble

3. The probability of selecting a rotten apple from a basket is 12%. One apple is selected from each of 3 different baskets. What is the probability of selecting 2 good apples and 1 rotten apple? Round answer to the nearest thousandth.

4. Events A and B are independent. $P(A) = \dfrac{2}{3}$ and $P(B) = \dfrac{7}{8}$. Find P(A and B).

5. Events A and B are dependent. $P(A) = 0.1$ and $P(B \mid A) = 0.1$. Find $P(A$ and $B)$.

6. A survey of high school students over the age of 16 showed that 47% of them worked during the summer. Of those who worked, 62% said they watched 2 hours or more of TV per day in the summer. Of those who did not work, 79% watched 2 hours or more. Make a probability tree diagram and use it to find the probability that a randomly chosen high school student older than 16 watched less than 2 hours of TV per day during the summer. (round answer to the nearest thousandth)

7. $P(A) = 0.2$, $P(B) = 0.55$, and $P(A$ or $B) = 0.6$.
a) Find $P(A$ and $B)$. Are events A and B mutually exclusive?

b) Find $P(B')$.

8. A card is randomly drawn from a standard 52-card deck. Find the probability that the card is:
a) an ace or a club   b) not an ace

9. To win the lottery, you must correctly select six different numbers from 1 to 50, in any order. What is the probability that you select the winning combination of numbers?

10. An art gallery has six paintings by the same painter. How many ways can 4 of the 6 paintings be arranged on a gallery wall?