

1. You toss a coin 15 times. What is the probability of getting 7 tails?

$${}_{15}C_7 (.5)^7 (.5)^8$$

2. You take a 20-question multiple choice test, with choices A, B, C, and D for each question. What is the probability that you will select 15 correct answers?

3. The probability that a stolen car will be recovered is 63%.
a) Find the probability that exactly 3 of 5 stolen cars will be recovered?

- b) Find the probability that at least 4 of 5 cars will be recovered?

$${}_5C_4 (.63)^4 (.37)^1 + {}_5C_5 (.63)^5$$

4. A jar contains 3 red, 4 green, and 5 blue marbles.

a) If 3 marbles are selected one at a time and replaced, find the probability of selecting one of each color.

b) If 2 marbles are selected one at a time and not replaced, find the probability that they are the same color.

$$\frac{3}{12} \cdot \frac{2}{11} + \frac{4}{12} \cdot \frac{3}{11} + \frac{5}{12} \cdot \frac{4}{11}$$

c) If marbles are selected 3 at a time, find the probability that at least 2 are green.

$$\frac{{}^4C_2 \times {}^8C_1}{{}^{12}C_3} + \frac{{}^4C_3}{{}^{12}C_3}$$

5. If 7 out of 11 persons surveyed said they have internet access, what is the probability that out of the next 4 persons asked, at least one of them will not have internet access?

$$1 - \left(\frac{7}{11} \cdot \frac{7}{11} \cdot \frac{7}{11} \cdot \frac{7}{11} \right)$$

have internet

6. A family of 4 is choosing 1 of 8 possible vacations. What is the probability that each family member chooses a different vacation?

$$\frac{8}{8} \times \frac{7}{8} \times \frac{6}{8} \times \frac{5}{8}$$

Mom Daughter Son Dad

7. Suppose that in Placentia, 95% of high school students graduated. A follow-up study showed that at age 25, 81% of the high school graduates held full-time jobs while only 63% of those who did not graduate held full-time jobs. What is the probability that a randomly selected student will not have a full-time job at age 25?

8. In a bag of 48 red and green marbles, some are opaque and some are translucent. If $\frac{1}{3}$ are red, $\frac{5}{12}$ are translucent, and $\frac{1}{2}$ are red or translucent, how many are red and translucent?

$$\begin{aligned} P(R \text{ or } T) &= P(R) + P(T) - P(R \text{ and } T) \\ \frac{1}{2} &= \frac{1}{3} + \frac{5}{12} \\ \frac{24}{48} &= \frac{16}{48} + \frac{20}{48} - \frac{x}{48} \end{aligned}$$

9. There are 25 cars in a parking lot. Eight are red and 13 have 4 doors. Six are both and have 4 doors. Find the probability that a randomly chosen car:
- a) will be red or have 4 doors b) is not red

