

# Probability - Long, w Combinations and Permutations-Review

MA 123  
Instructor  
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Tony buys a bag of cookies that contains 9 chocolate chip cookies, 4 peanut butter cookies, 4 sugar cookies and 7 oatmeal cookies.

What is the probability that Tony reaches in the bag and randomly selects an oatmeal cookie from the bag, eats it, then reaches back in the bag and randomly selects a chocolate chip cookie?

 

Give your answer as a fraction, or accurate to at least 4 decimal places.

Suppose a jar contains 5 red marbles and 12 blue marbles. If you reach in the jar and pull out 2 marbles at random at the same time, find the probability that both are red.

 ♂

A certain virus affects 0.8% of the population. A test used to detect the virus in a person is positive 85% of the time if the person has the virus (true positive) and 11% of the time if the person does not have the virus (false positive). Fill out the remainder of the following table and use it to answer the two questions below.

	Infected	Not Infected	Total
Positive Test	<input type="text"/> ♂	<input type="text"/> ♂	<input type="text"/> ♂
Negative Test	<input type="text"/> ♂	<input type="text"/> ♂	<input type="text"/> ♂
Total	800	99,200	100,000

a) Find the probability that a person has the virus given that they have tested positive. Round your answer to the nearest tenth of a percent and do not include a percent sign.

$$P(\text{Infected} \mid \text{Positive Test}) = \boxed{\phantom{00}} \text{ ♂ } \%$$

b) Find the probability that a person does not have the virus given that they test negative. Round your answer to the nearest tenth of a percent and do not include a percent sign.

$$P(\text{Not Infected} \mid \text{Negative Test}) = \boxed{\phantom{00}} \text{ ♂ } \%$$

A company has 7 male and 6 female employees, and needs to nominate 3 men and 3 women for the company bowling team. How many different teams can be formed?

 ♂

Tickets for a raffle cost \$10. There were 675 tickets sold. One ticket will be randomly selected as the winner, and that person wins \$2000 and also the person is given back the cost of the ticket. For someone who buys a ticket, what is the Expected Value (the mean of the distribution)?

If the Expected Value is negative, be sure to include the "-" sign with the answer. Express the answer rounded to two decimal places.

Expected Value = \$  ⚡