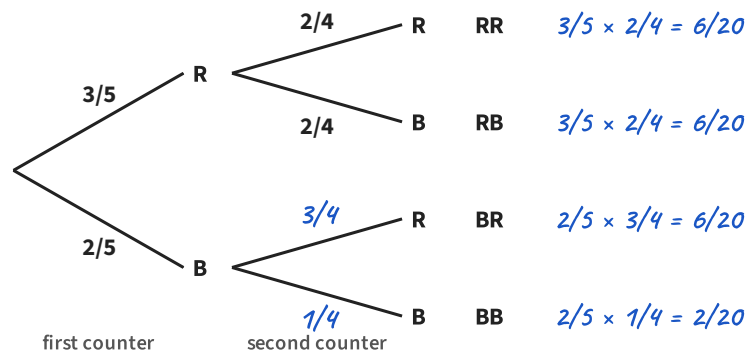


Tree Diagrams: Without Replacement

1

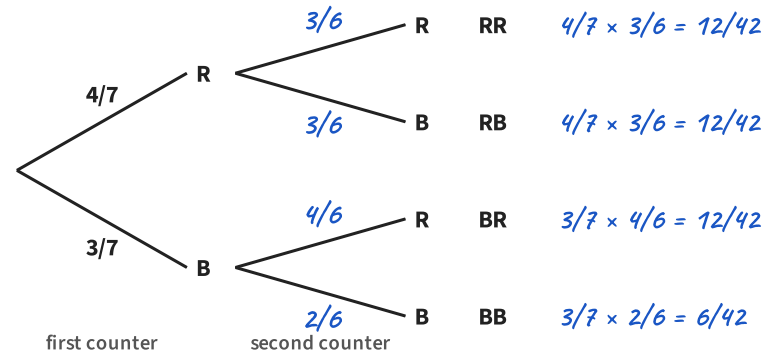
A bag holds 3 red and 2 blue counters. Two are taken without replacement. Find the probability that both are red.



Answer $\frac{3}{10}$

2

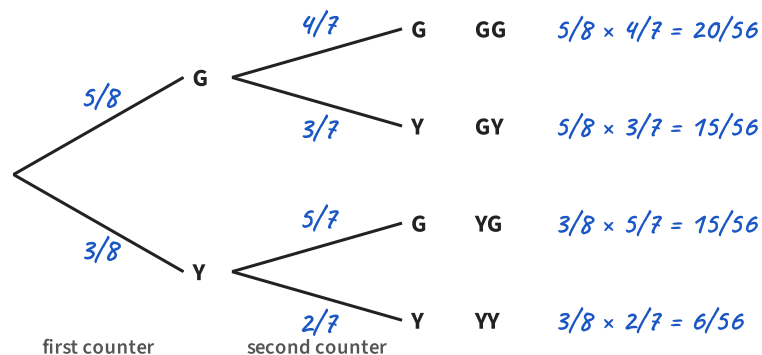
A bag holds 4 red and 3 blue counters. Two are taken without replacement. Find the probability that both are blue.



Answer $\frac{1}{7}$

3

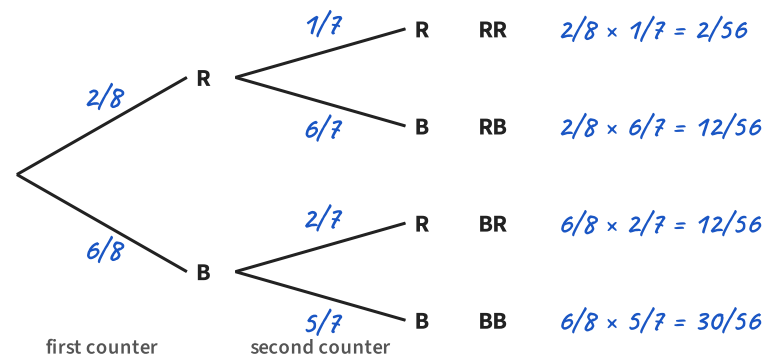
A bag holds 5 green and 3 yellow counters. Two are taken without replacement. Find the probability that both are green.



Answer $\frac{5}{14}$

4

A bag holds 2 red and 6 blue counters. Two are taken without replacement. Find the probability that both are blue.

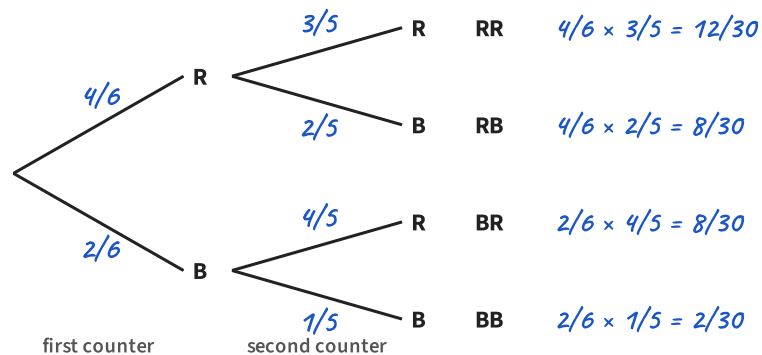


Answer $\frac{15}{28}$

Tree Diagrams: Without Replacement

5

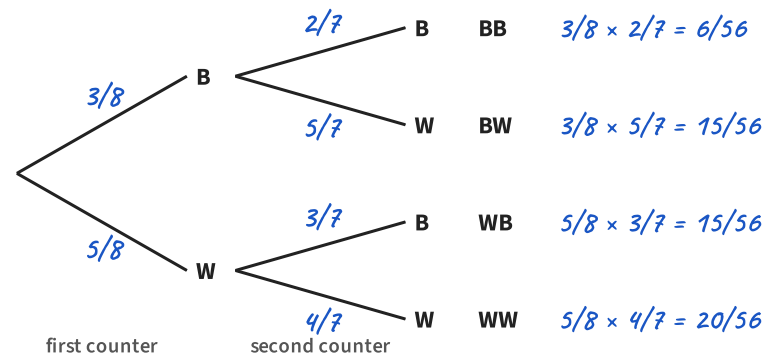
A bag holds 4 red and 2 blue counters. Two are taken without replacement. Find the probability that one is red and one is blue.



Answer $\frac{8}{15}$

6

A bag holds 3 black and 5 white counters. Two are taken without replacement. Find the probability that both are the same colour.



Answer $\frac{13}{28}$

7

A bag holds 6 red and 4 blue counters. Two are taken without replacement. Find the probability that both are red.

$$6/10 \times 5/9$$

Answer $\frac{1}{3}$

8

A bag holds 5 red and 5 blue counters. Two are taken without replacement. Find the probability that one is red and one is blue.

$$5/10 \times 5/9 + 5/10 \times 5/9$$

Answer $\frac{5}{9}$

Tree Diagrams: Without Replacement *further practice*

ANSWERS 

9

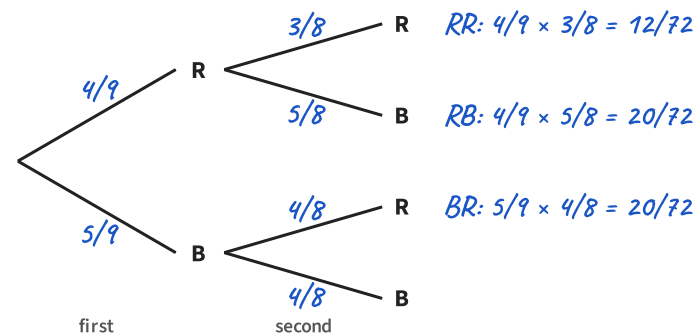
A drawer holds 5 black socks and 3 grey socks. Two socks are taken at random, without replacement. Find the probability that both socks are black.

$$\frac{5}{8} \times \frac{4}{7} = \frac{20}{56} = \frac{5}{14}$$

Answer $\frac{5}{14}$

10

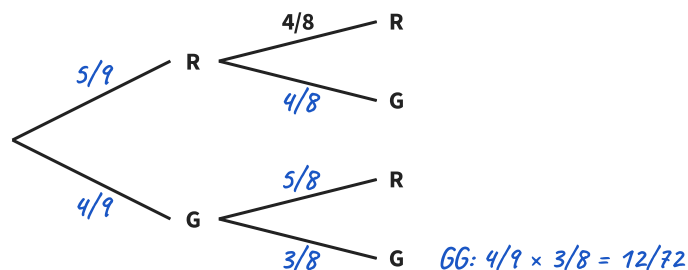
A bag holds 4 red and 5 blue counters. Two counters are taken at random, without replacement. Complete the tree diagram. Find the probability that at least one counter is red.



Answer $\frac{12}{72} + \frac{20}{72} + \frac{20}{72} = \frac{52}{72} = \frac{13}{18}$

11

A bag holds red and green counters. Two are taken at random, without replacement. The tree shows one of the probabilities. How many counters of each colour were in the bag? Then find the probability that both counters are green.



Bag 5 red, 4 green (9 counters)

P(both green) $\frac{12}{72} = \frac{1}{6}$

12

A tin holds 6 chocolate biscuits and 4 plain biscuits. Lena takes two biscuits at random, without replacement. Find the probability that she gets one of each kind.

$$\frac{6}{10} \times \frac{4}{9} + \frac{4}{10} \times \frac{6}{9} = \frac{48}{90} = \frac{8}{15}$$

Answer $\frac{8}{15}$

Tree Diagrams: Without Replacement *further practice*

ANSWERS 

13

A bag holds 3 red, 2 blue and 1 green counter. Two counters are taken at random, without replacement. Find the probability that both counters are the same colour. You may draw a tree diagram.

$$RR: \frac{3}{6} \times \frac{2}{5} = \frac{6}{30} \quad BB: \frac{2}{6} \times \frac{1}{5} = \frac{2}{30} \quad GG: \frac{1}{6} \times \frac{0}{5} = 0$$

$$\frac{6}{30} + \frac{2}{30} + 0 = \frac{8}{30} = \frac{4}{15}$$

Answer $\frac{4}{15}$

14

Jar X holds 3 red and 2 yellow sweets. Jar Y holds 6 red and 4 yellow sweets. Two sweets are taken at random, without replacement, from one jar. Which jar gives the greater probability of two red sweets? Show your working.

$$X: \frac{3}{5} \times \frac{2}{4} = \frac{3}{10} \quad Y: \frac{6}{10} \times \frac{5}{9} = \frac{30}{90} = \frac{1}{3}$$

Answer Jar Y ($\frac{1}{3} = \frac{10}{30}$ is more than $\frac{3}{10} = \frac{9}{30}$)

15

A box holds 10 pens. Some of them are red. Two pens are taken at random, without replacement. The probability that both are red is $\frac{1}{15}$. How many red pens are in the box?

$$\frac{3}{10} \times \frac{2}{9} = \frac{6}{90} = \frac{1}{15}, \text{ so 3 red pens}$$

Answer 3 red pens

16

A bag holds 4 red and 4 blue counters. Two are taken at random, without replacement. Amir says getting two the same colour and getting one of each colour are equally likely. Is Amir right? Explain.

$$\text{same: } \frac{4}{8} \times \frac{3}{7} + \frac{4}{8} \times \frac{3}{7} = \frac{24}{56} = \frac{3}{7} \quad \text{one of each: } \frac{4}{7}$$

No. One of each ($\frac{4}{7}$) is more likely than the same colour ($\frac{3}{7}$).

After the first counter there are fewer of that colour left.