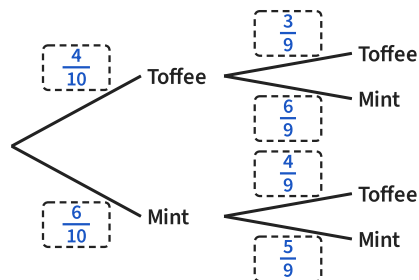


Conditional Probability: Tree Diagrams *stretch*

ANSWERS

1

A tin holds 4 toffees and 6 mints. Two are taken at random without replacement. Complete the tree and find $P(\text{two mints})$.

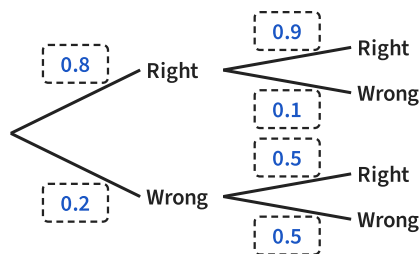


$$\frac{6}{10} \times \frac{5}{9} = \frac{30}{90}$$

Answer $\frac{1}{3}$

2

Jo gets quiz question 1 right with probability 0.8. If she gets it right, she gets question 2 right with probability 0.9; if not, 0.5. Find $P(\text{exactly one right})$.

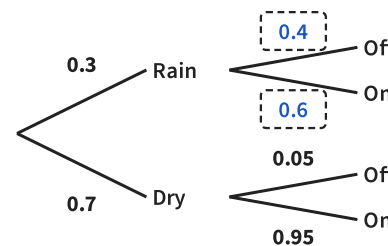


$$0.8 \times 0.1 + 0.2 \times 0.5$$

Answer 0.18

3

The tree diagram shows whether a match is on or off. The probability that it rains and the match is off is 0.12. Find the two missing probabilities.

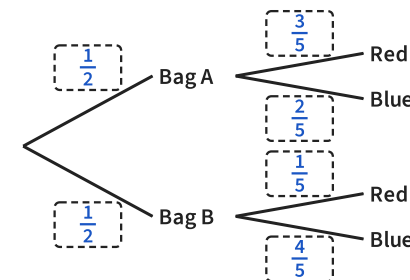


$$0.12 \div 0.3 = 0.4$$

Answer $0.4 \text{ and } 0.6$

4

Bag A holds 3 red and 2 blue counters, bag B 1 red and 4 blue. Flip a coin: heads, take a counter from bag A; tails, bag B. Find $P(\text{red})$.



$$\frac{3}{10} + \frac{1}{10}$$

Answer $\frac{2}{5}$

5

A drawer holds 4 white socks and 2 black socks. Ade takes socks out at random, one at a time, until he gets a black one. Find the probability that he takes exactly three socks.



$$\frac{4}{6} \times \frac{3}{5} \times \frac{2}{4} = \frac{24}{120}$$

Answer $\frac{1}{5}$

6

A bag holds 5 green and 4 yellow counters. Two are taken without replacement. Zara says the probability that both are green is $\frac{5}{9} \times \frac{5}{9} = \frac{25}{81}$. Explain her mistake and find the correct probability.



the second counter is from 8 counters, 4 of them green

$$\frac{5}{9} \times \frac{4}{8} = \frac{20}{72}$$

Answer $\frac{5}{18}$

7

The probability that Ali passes his driving test at the first attempt is 0.6. If he fails, the probability that he passes at the second attempt is 0.75. Find the probability that he passes within two attempts.

$$0.6 + 0.4 \times 0.75$$

$$\text{or } 1 - 0.4 \times 0.25$$

Answer 0.9

8

A bag holds 3 red and 3 blue counters. Two are taken. Is it more likely that they are the same colour with replacement or without? Show how you know.



$$\text{with: } \frac{18}{36} = \frac{1}{2}; \text{ without: } \frac{12}{30} = \frac{2}{5}$$

Reason with replacement