

Tree Diagrams

ANSWERS

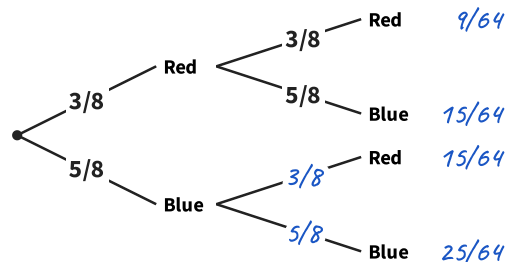
1

A bag has 3 red and 5 blue counters. A counter is taken and replaced, then a second counter is taken.

(a) Complete the tree diagram. (b) Find the probability that both are red. (c) Find the probability that they are different colours.

(b) $\frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$

(c) $\frac{3}{8} \times \frac{5}{8} + \frac{5}{8} \times \frac{3}{8} = \frac{15}{32}$



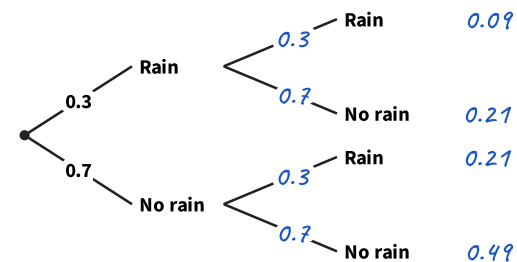
2

The probability it rains on any day is 0.3. Look at two days.

(a) Complete the tree diagram. (b) Find the probability that it rains on both days. (c) Find the probability that it rains on exactly one day.

(b) $0.3 \times 0.3 = 0.09$

(c) $0.3 \times 0.7 + 0.7 \times 0.3 = 0.42$



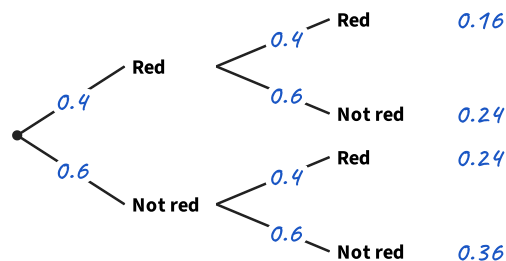
3

A spinner lands on red with probability 0.4. It is spun twice.

(a) Complete the tree diagram. (b) Find the probability that both spins are red. (c) Find the probability that at least one spin is red.

(b) $0.4 \times 0.4 = 0.16$

(c) $0.4 \times 0.4 + 0.4 \times 0.6 + 0.6 \times 0.4 = 0.64$



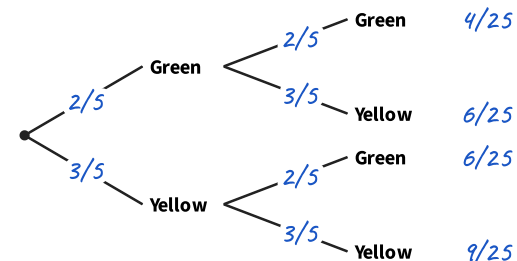
4

A bag has 2 green and 3 yellow balls. A ball is taken and replaced, then a second ball is taken.

(a) Complete the tree diagram. (b) Find the probability that both are yellow. (c) Find the probability that the balls are different colours.

(b) $\frac{3}{5} \times \frac{3}{5} = \frac{9}{25}$

(c) $\frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{2}{5} = \frac{12}{25}$



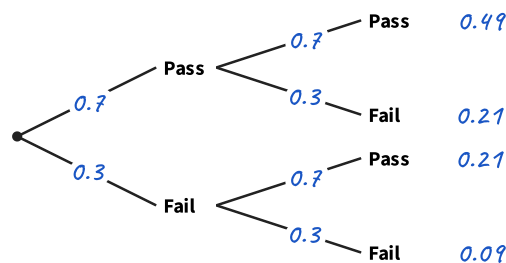
5

Sam passes a quiz with probability 0.7. He takes two quizzes.

(a) Complete the tree diagram. (b) Find the probability that he passes both. (c) Find the probability that he passes exactly one.

(b) $0.7 \times 0.7 = 0.49$

(c) $0.7 \times 0.3 + 0.3 \times 0.7 = 0.42$



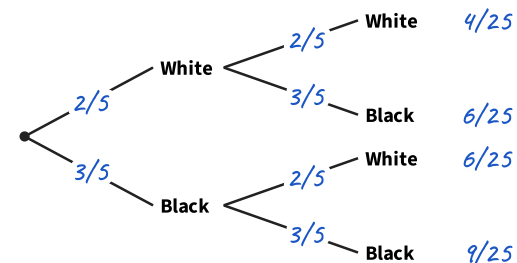
6

A box has 4 white and 6 black tiles. A tile is taken and replaced, then another is taken.

(a) Complete the tree diagram. (b) Find the probability that both are white. (c) Find the probability that at least one is black.

(b) $\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$

(c) $\frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{2}{5} + \frac{3}{5} \times \frac{3}{5} = \frac{21}{25}$



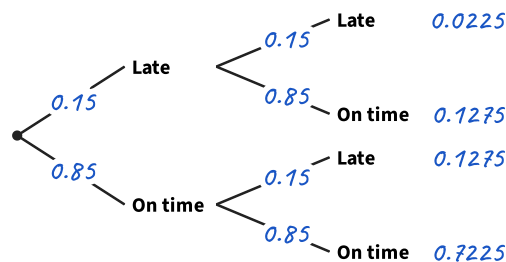
7

The probability a bus is late is 0.15. Look at two journeys.

(a) Draw a tree diagram. (b) Find the probability that the bus is late both times. (c) Find the probability that the bus is on time both times.

(b) $0.15 \times 0.15 = 0.0225$

(c) $0.85 \times 0.85 = 0.7225$



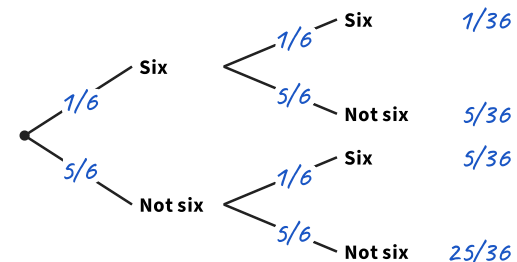
8

A fair dice is rolled twice. Look at whether each roll is a six.

(a) Draw a tree diagram. (b) Find the probability that neither roll is a six. (c) Find the probability that exactly one roll is a six.

(b) $\frac{5}{6} \times \frac{5}{6} = \frac{25}{36}$

(c) $\frac{1}{6} \times \frac{5}{6} + \frac{5}{6} \times \frac{1}{6} = \frac{5}{18}$



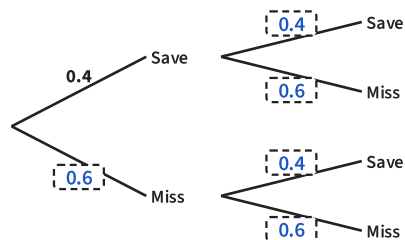
Tree Diagrams *further practice*

ANSWERS

9

The probability that a goalkeeper saves a penalty is 0.4. She faces two penalties, independently.

(a) Complete the tree diagram. (b) Find the probability that she saves exactly one of the two penalties.



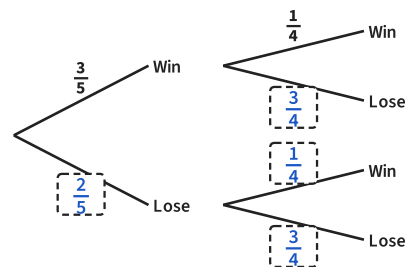
$$0.4 \times 0.6 + 0.6 \times 0.4$$

(b) 0.48

10

Kit plays a game of chess, then a game of draughts. $P(\text{wins at chess}) = \frac{3}{5}$ and $P(\text{wins at draughts}) = \frac{1}{4}$, independently.

(a) Complete the tree diagram. (b) Find the probability that Kit wins exactly one of the two games.

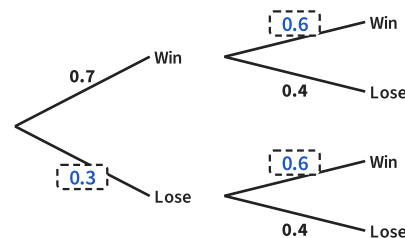


$$\frac{9}{20} + \frac{2}{20} = \frac{11}{20}$$

(b) $\frac{11}{20}$

11

A team plays two matches. Some of the probabilities are on the tree diagram. Fill in the missing probabilities. Find the probability that the team loses both matches.



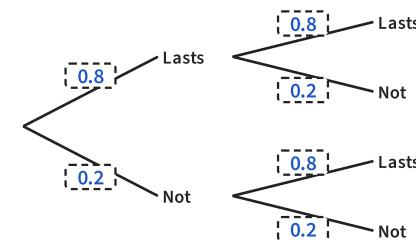
$$0.3 \times 0.4$$

Answer 0.12

12

The probability that a phone battery lasts all day is 0.8. Ravi has two phones whose batteries work independently.

(a) Complete the tree diagram. (b) Find the probability that at least one of the two batteries lasts all day.

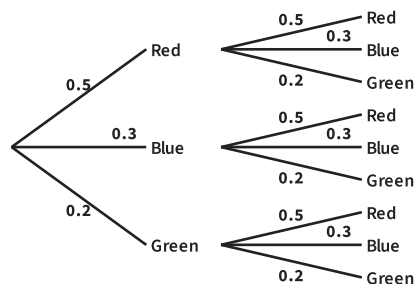


$$1 - 0.2 \times 0.2 = 1 - 0.04$$

(b) 0.96

13

A spinner lands on red, blue or green. It is spun twice. The tree diagram shows the probabilities. Find the probability that both spins land on the same colour.

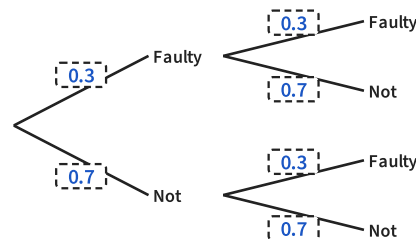


$$0.25 + 0.09 + 0.04 = 0.38$$

Answer 0.38

14

A machine makes two parts. Each part is faulty with the same probability, independently. The probability that both parts are faulty is 0.09. Find the probability that neither part is faulty.

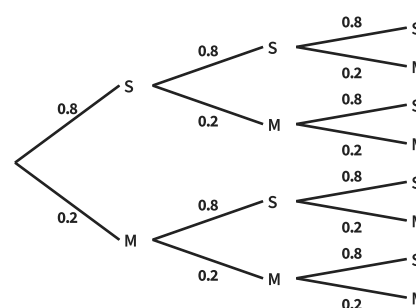


$$0.3 \times 0.3 = 0.09, \text{ so } 0.7 \times 0.7$$

Answer 0.49

15

Ella takes three penalties. Each time, independently, she scores (S) with probability 0.8 or misses (M). Find the probability that she scores exactly two of the three.

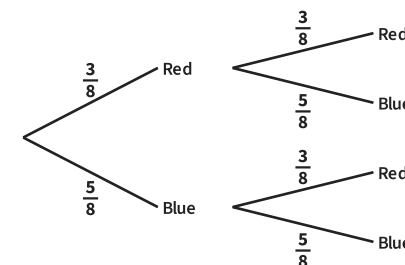


$$3 \times 0.128 = 0.384$$

Answer 0.384

16

A bag holds 3 red and 5 blue counters. A counter is taken and replaced, then another is taken. Zoe says $P(\text{two different colours}) = \frac{3}{8} \times \frac{5}{8} = \frac{15}{64}$. Is Zoe right? Explain.



she has left out blue then red

Answer No, it is $\frac{15}{32}$