

PROBABILITY TREES - PRACTICE QUESTIONS

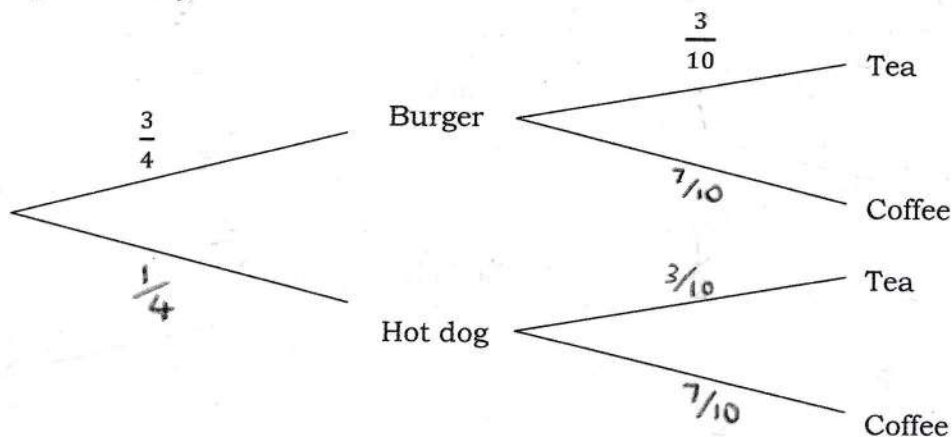
1.

Amy is going to a fast food stand.

She can buy a burger or a hot dog, and a tea or a coffee.

The probability tree below shows the probability of buying each item.

(a) Complete the probability tree.



(b) What is the probability that Amy buys a burger and a tea?

$$\frac{3}{4} \times \frac{3}{10} = \frac{9}{40}$$

(c) What is the probability that Amy buys a hot dog and a coffee?

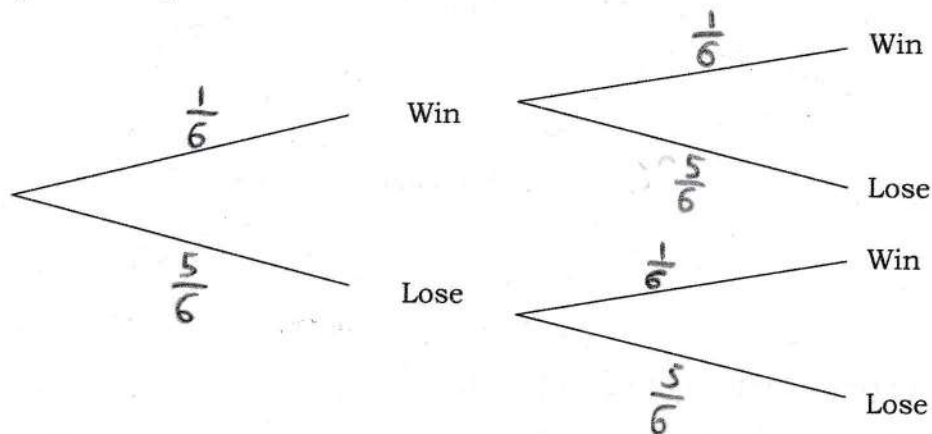
$$\frac{1}{4} \times \frac{7}{10} = \frac{7}{40}$$

2.

Brett is going to play a video game twice.

The probability that Brett wins the game is $\frac{1}{6}$.

(a) Complete the probability tree.

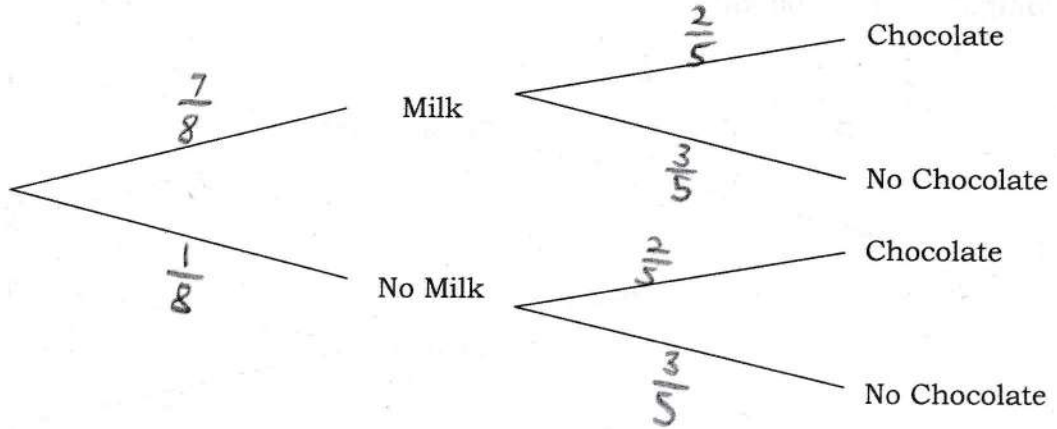


(b) What is the probability that Brett loses twice?

$$\frac{5}{6} \times \frac{5}{6} = \frac{25}{36}$$

3. Carlene is going to the supermarket.
 The probability that she buys chocolate is $\frac{2}{5}$.
 The probability that she buys milk is $\frac{7}{8}$.

(a) Complete the probability tree.

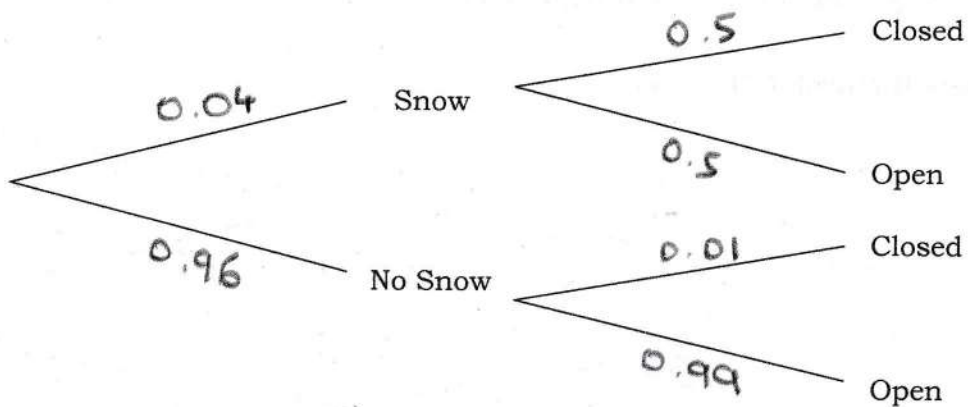


(b) What is the probability that Carlene buys milk but not chocolate?

$$\frac{7}{8} \times \frac{3}{5} = \frac{21}{40}$$

4. The probability that it snows is 0.04.
 If it snows, the probability that school is closed is 0.5.
 If it doesn't snow, the probability that school is closed is 0.01.

(a) Complete the probability tree.



(b) What is the probability that school is closed?

$$0.04 \times 0.5 = 0.02$$

$$0.96 \times 0.01 = 0.0096$$

$$0.02 + 0.0096 = \underline{0.0296}$$

5.

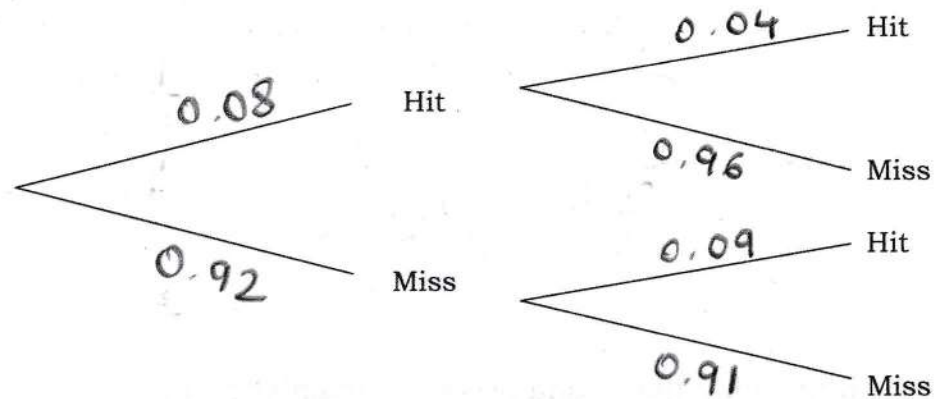
Douglas is going to throw two darts at bullseye.

The probability of the first throw hitting the bullseye is 0.08.

If the first throw hits, the probability of the second throw hitting is 0.04.

If the first throw misses, the probability of the second throw hitting is 0.09.

(a) Complete the probability tree.



(b) What is the probability that Douglas hits the bullseye only once?

$$0.08 \times 0.96 = 0.0768$$

$$0.92 \times 0.09 = 0.0828$$

$$0.0768 + 0.0828 = \underline{0.1596}$$

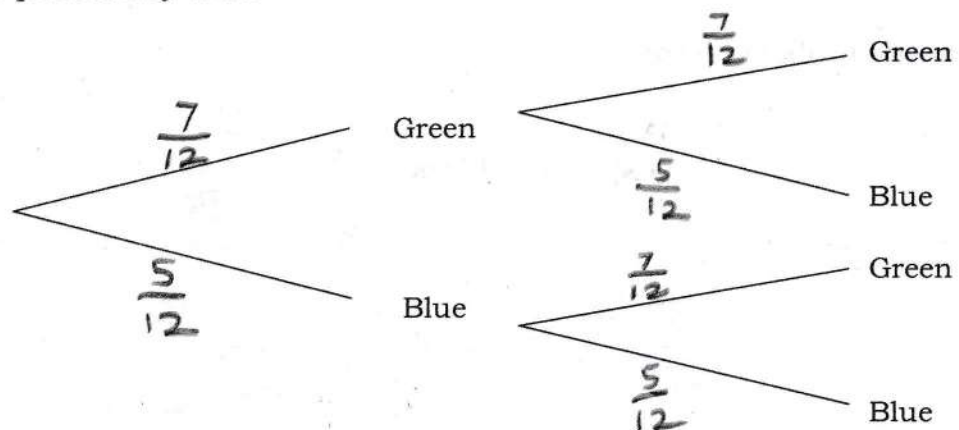
6.

Edwin has a bag of marbles.

The bag contains 7 green marbles and 5 blue marbles.

He is going to pick two marbles from the bag, **with replacement**.

(a) Complete the probability tree.



(b) What is the probability that Edwin picks two marbles of the same colour?

$$\frac{7}{12} \times \frac{7}{12} = \frac{49}{144}$$

$$\frac{5}{12} \times \frac{5}{12} = \frac{25}{144}$$

$$\frac{49}{144} + \frac{25}{144} = \frac{37}{72}$$

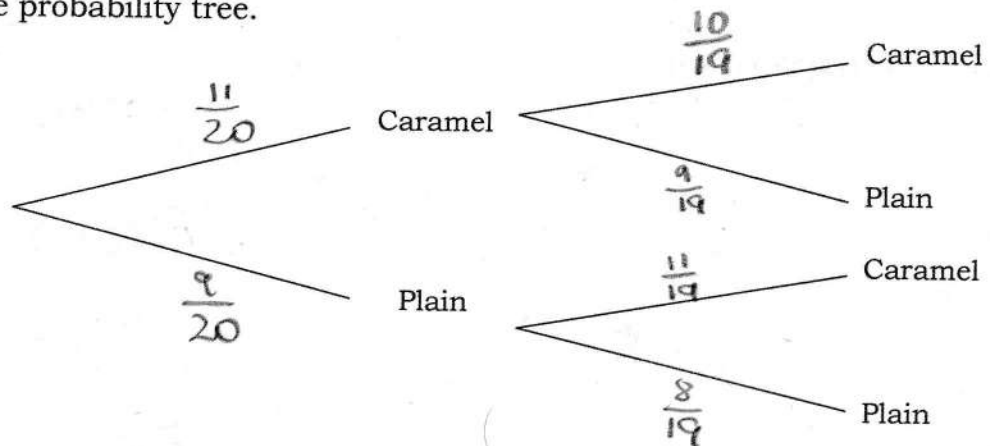
7.

Fiona has a box of chocolates.

The box contains 11 caramel chocolates and 9 plain chocolates.

She is going to pick two chocolates at random, **without replacement**.

(a) Complete the probability tree.



(b) What is the probability that Fiona picks two plain chocolates?

$$\frac{9}{20} \times \frac{8}{19} = \frac{18}{95}$$

(c) What is the probability that Fiona picks a caramel and a plain chocolate?

$$\frac{11}{20} \times \frac{9}{19} = \frac{99}{380}$$

$$\frac{9}{20} \times \frac{11}{19} = \frac{99}{380}$$

$$\frac{99}{380} + \frac{99}{380} = \frac{99}{190}$$

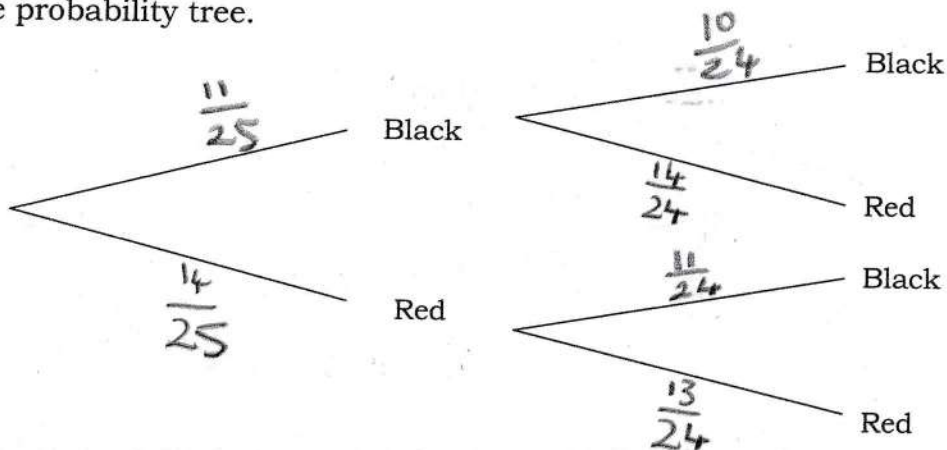
8.

Glyn has a deck of 25 cards.

11 of the cards are black and the rest are red.

He is going to pick two cards from the deck, without replacement.

(a) Complete the probability tree.



(b) What is the probability that Glyn does not pick a red card?

$$\frac{11}{25} \times \frac{10}{24} = \frac{11}{60}$$

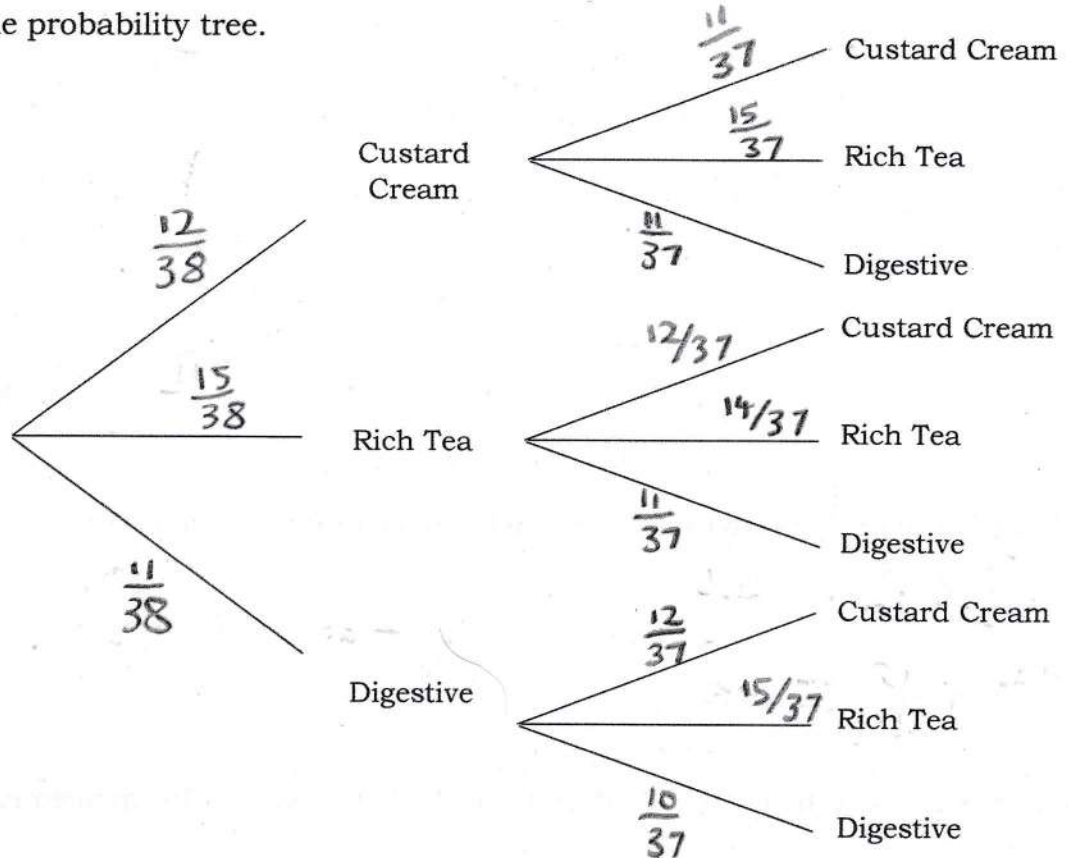
9.

Harriet has a tin of biscuits.

The tin contains 12 custard creams, 15 rich teas and 11 digestives.

She is going to pick two biscuits from the tin to eat. = without replacement

(a) Complete the probability tree.



(b) What is the probability that Harriet eats two digestives?

$$\frac{11}{38} \times \frac{10}{37} = \frac{55}{703}$$

(c) What is the probability that Harriet eats a rich tea and a custard cream?

$$\frac{12}{38} \times \frac{15}{37} = \frac{90}{703}$$

$$\frac{15}{38} \times \frac{12}{37} = \frac{90}{703}$$

$$\frac{90}{703} + \frac{90}{703} = \frac{180}{703}$$

(d) What is the probability that Harriet eats two biscuits of the same type?

$$\text{Two digestives} = \frac{55}{703}$$

$$\text{Two RT} = \frac{15}{38} \times \frac{14}{37} = \frac{105}{703}$$

$$\text{Two CC} = \frac{12}{38} \times \frac{11}{37} = \frac{66}{703}$$

$$\frac{55}{703} + \frac{66}{703} + \frac{105}{703} = \frac{226}{703}$$

(e) What is the probability that Harriet eats two different biscuits?

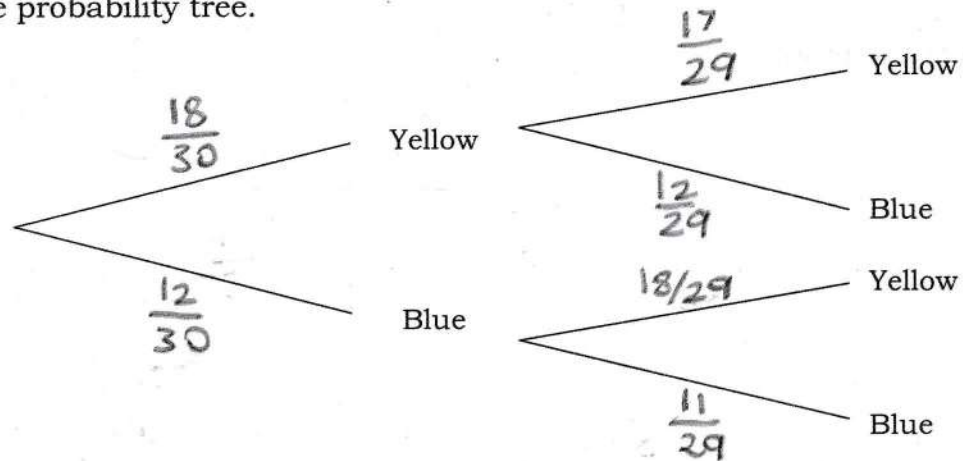
$$1 - \frac{226}{703} = \frac{477}{703}$$

10.

A bag contains 18 yellow counters and 12 blue counters.

Imran is going to pick two counters from the bag, without replacement.

(a) Complete the probability tree.

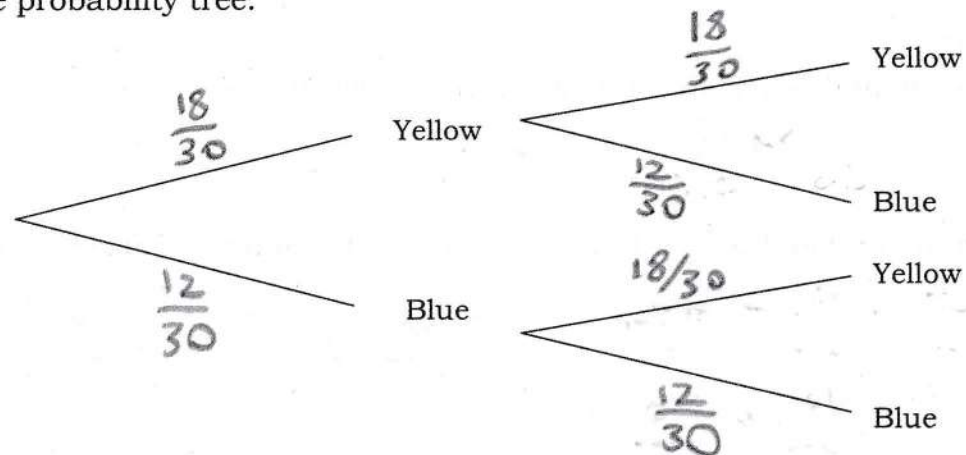


(b) What is the probability that Imran picks two counters of different colours?

$$\frac{18}{30} \times \frac{12}{29} = \frac{36}{145}$$
$$\frac{12}{30} \times \frac{18}{29} = \frac{36}{145}$$
$$\frac{36}{145} + \frac{36}{145} = \frac{72}{145}$$

Jasmine is going to pick two counters from the same bag, with replacement.

(c) Complete the probability tree.



(d) What is the probability that Jasmine picks two counters of different colours?

$$\frac{18}{30} \times \frac{12}{30} = \frac{6}{25}$$
$$\frac{12}{30} \times \frac{18}{30} = \frac{6}{25}$$
$$\frac{6}{25} + \frac{6}{25} = \frac{12}{25}$$

(e) Who is more likely to pick two counters of different colours – Imran or Jasmine?

$$\text{Imran} = \frac{72}{145} = 0.4965\dots$$

$$\text{Jasmine} = \frac{12}{25} = 0.48$$

Imran

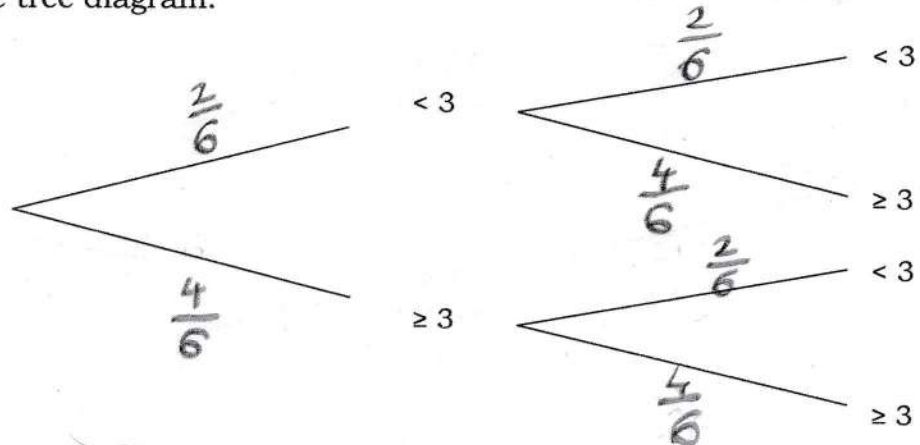
11.

Kristina is playing a game with two fair six-sided dice.

She is going to roll the dice.

She wins the game if she rolls both numbers less than 3.

(a) Complete the tree diagram.



(b) What is the probability that Kristina wins the game?

$$\frac{2}{6} \times \frac{2}{6} = \frac{1}{9}$$

(c) What is the probability that Kristina loses the game?

$$1 - \frac{1}{9} = \frac{8}{9}$$

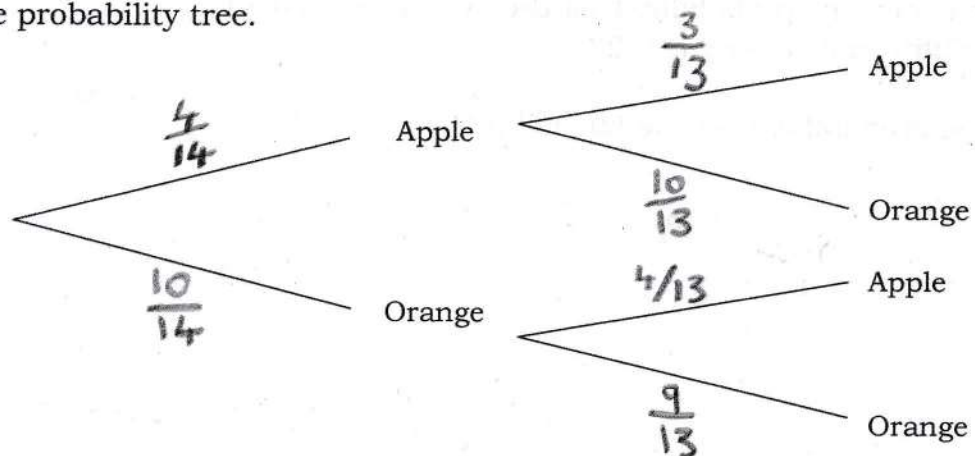
12.

Leo is packing his school lunch.

He is going to pick two items of fruit at random from his fruit bowl and take them to school.

The fruit bowl contains 4 apples and 10 oranges.

(a) Complete the probability tree.



(b) What is the probability that Leo picks an apple and an orange?

$$\frac{4}{14} \times \frac{10}{13} = \frac{20}{91}$$

$$\frac{10}{14} \times \frac{4}{13} = \frac{20}{91}$$

$$\frac{20}{91} + \frac{20}{91} = \frac{40}{91}$$

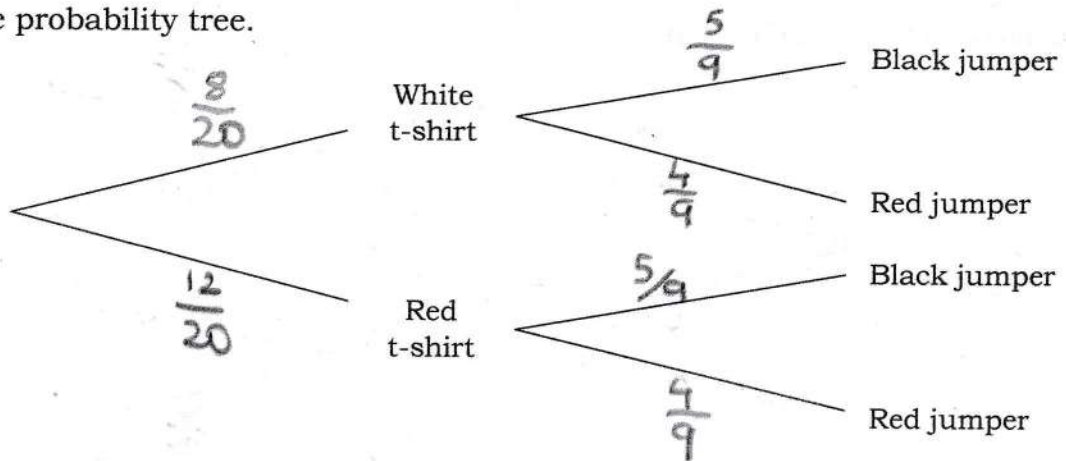
13.

In Henry's wardrobe, he has t-shirts and jumpers.

He has 8 white t-shirts, 5 black jumpers, 12 red t-shirts and 4 red jumpers.

He is going to pick a jumper and a t-shirt at random from the wardrobe.

(a) Complete the probability tree.



(b) What is the probability that Henry picks a white t-shirt and a black jumper?

$$\frac{8}{20} \times \frac{5}{9} = \frac{2}{9}$$

(c) What is the probability that Henry picks only one red item of clothing?

$$\frac{8}{20} \times \frac{4}{9} = \frac{8}{45}$$

$$\frac{8}{45} + \frac{1}{3} = \frac{23}{45}$$

$$\frac{12}{20} \times \frac{5}{9} = \frac{1}{3}$$

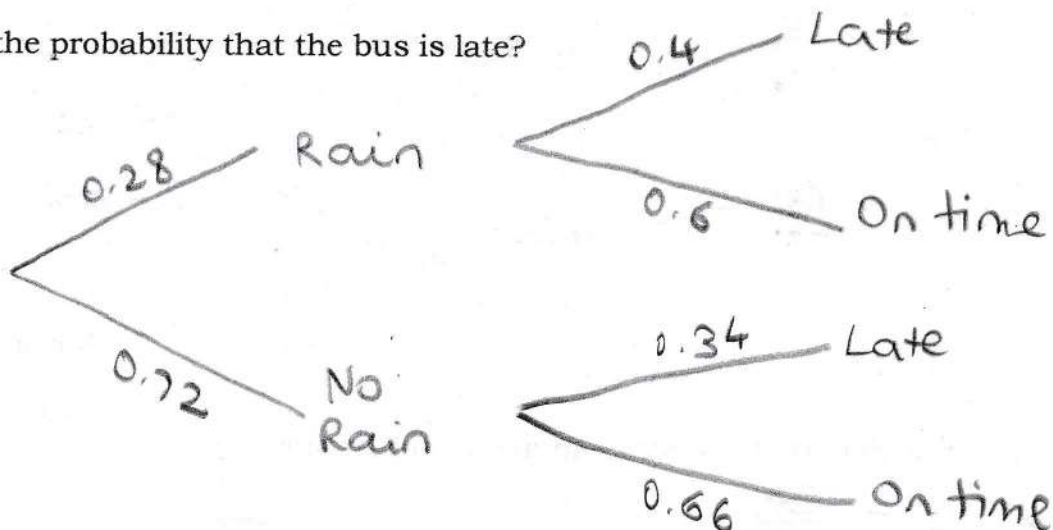
14.

If it rains, the probability that the bus is late is 0.4.

If it doesn't rain, the probability that the bus is late is 0.34.

The probability of it raining is 0.28.

What is the probability that the bus is late?



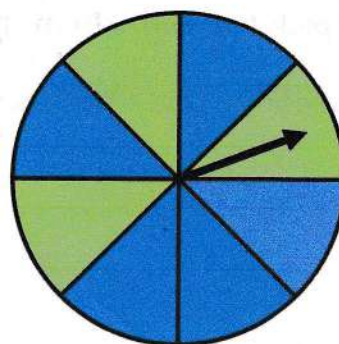
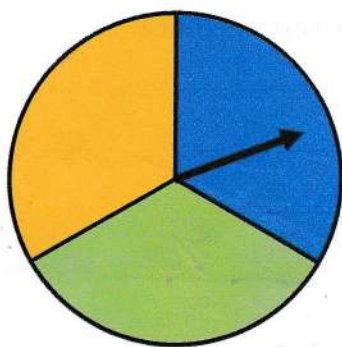
$$0.28 \times 0.4 = 0.112$$

$$0.72 \times 0.34 = 0.2448$$

$$0.112 + 0.2448 = \underline{\underline{0.3568}}$$

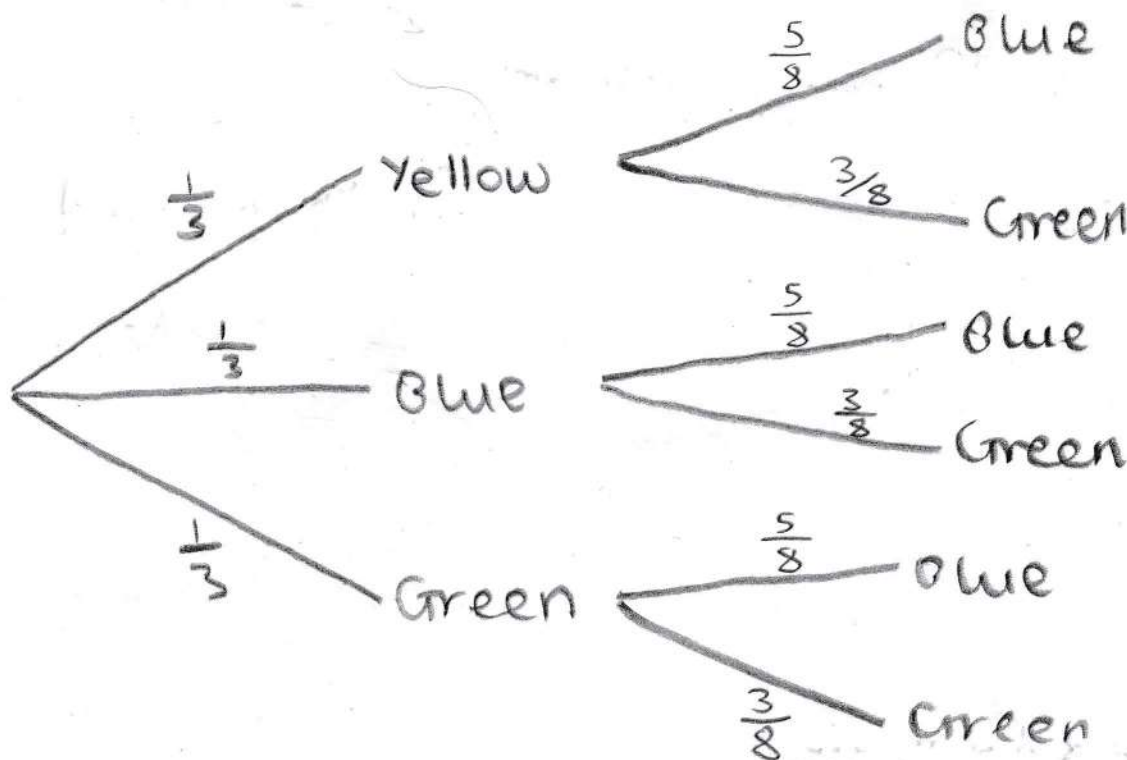
15.

Ned has two fair spinners, pictured below.



Ned is going to spin both spinners.

Work out the probability that Ned lands on the same colour twice.



$$\frac{1}{3} \times \frac{5}{8} = \frac{5}{24}$$

$$\frac{1}{3} \times \frac{3}{8} = \frac{1}{8}$$

$$\frac{5}{24} + \frac{1}{8} = \left(\frac{1}{3}\right)$$

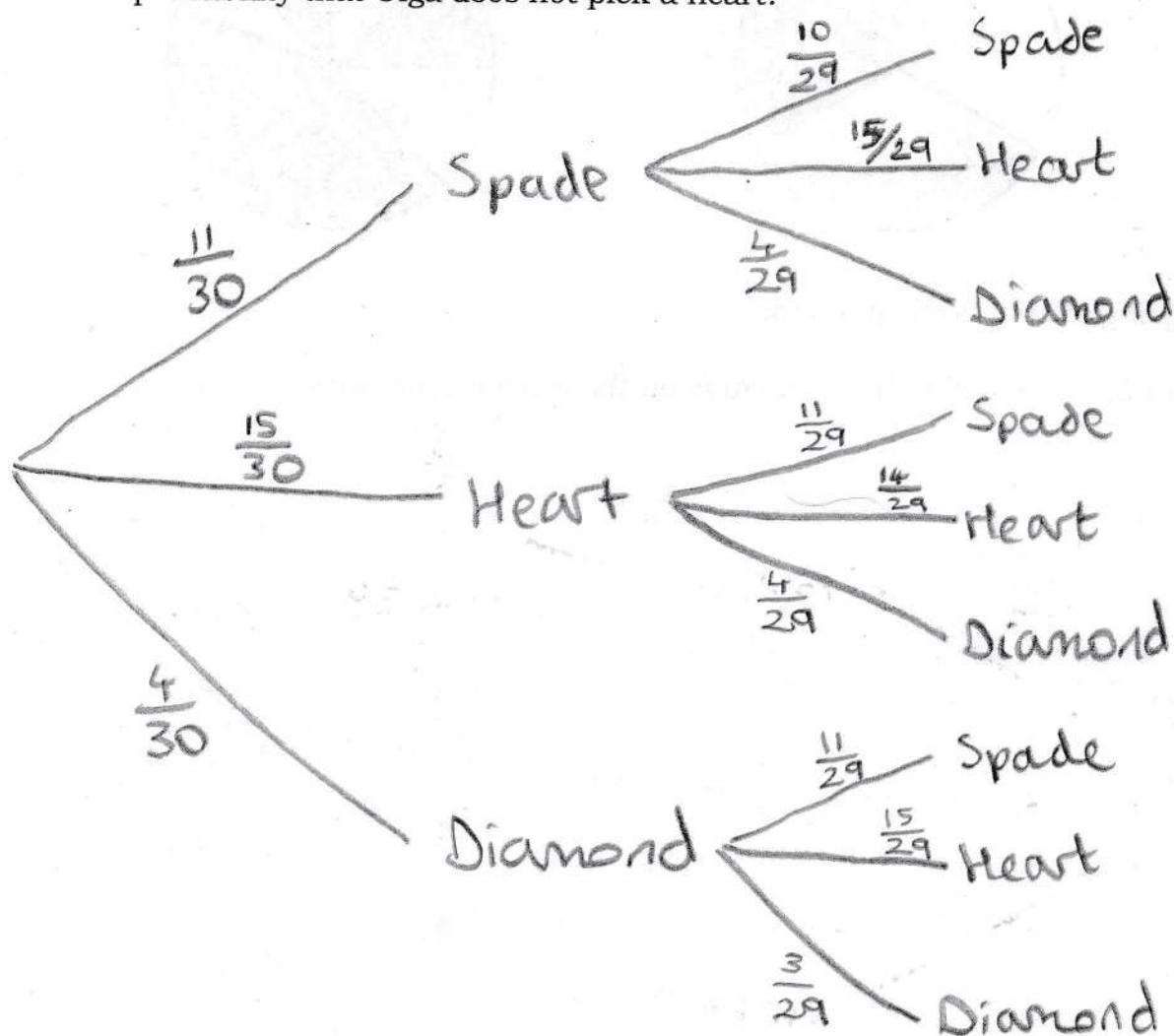
16.

Olga has a deck of 30 playing cards.

There are 11 spades, 15 hearts and 4 diamonds.

She is going to pick two cards from the deck, without replacement.

What is the probability that Olga does not pick a heart?



$$SS: \frac{11}{30} \times \frac{10}{29} = \frac{11}{87}$$

$$SD: \frac{11}{30} \times \frac{4}{29} = \frac{22}{435}$$

$$DS: \frac{4}{30} \times \frac{11}{29} = \frac{22}{435}$$

$$DD: \frac{4}{30} \times \frac{3}{29} = \frac{2}{145}$$

$$\frac{11}{87} + \frac{22}{435} + \frac{22}{435} + \frac{2}{145} = \left(\frac{7}{29} \right)$$