

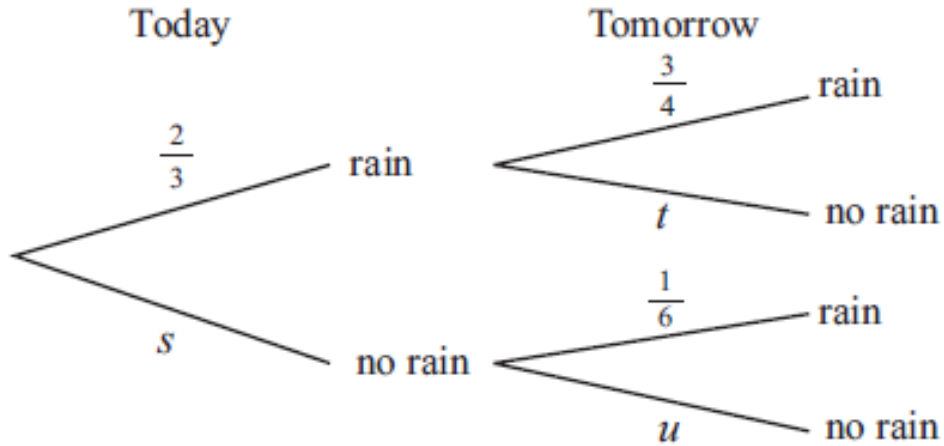
Problem 2

The probability that it rains today is $\frac{2}{3}$.

If it rains today, the probability that it will rain tomorrow is $\frac{3}{4}$.

If it does not rain today, the probability that it will rain tomorrow is $\frac{1}{6}$.

The tree diagram below shows this information.



(a) Write down, as fractions, the values of s , t and u .

Answer: [2]

(b) Calculate the probability that it will not rain on both days.

Answer: [2]

(c) Calculate the probability that it will not rain tomorrow.

Answer: [2]

Problem 3

Two unbiased spinners are used in a game.

One spinner is numbered from 1 to 6 and the other is numbered from 1 to 3.

The scores on each spinner are multiplied together.

(a) Construct a possibility diagram for this experiment. [3]

(b) Find the possibility that the outcome is

(i) even,

Answer: [1]

(ii) even and it is also greater than 11.

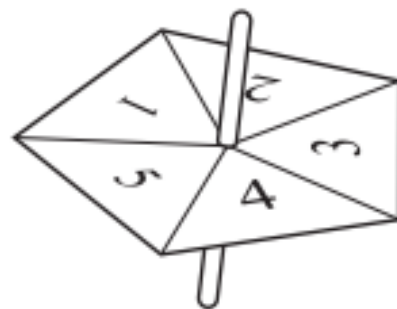
Answer: [1]

Problem 4

Jonah uses a fair five-sided spinner in a game.

What is the probability that the spinner lands on

(a) 3



Answer: [1]

(b) an even number

Answer: [1]

(c) prime number

Answer: [1]

Problem 5

Claude goes to school by bus.

If the bus is late, the probability that Claude is late to school is 0.8.

If the bus is not late, the probability that Claude is late to school is 0.05.

(a) Create a probability tree about this information.

[3]

(a) Calculate the probability that the bus is late and Claude is late to school.

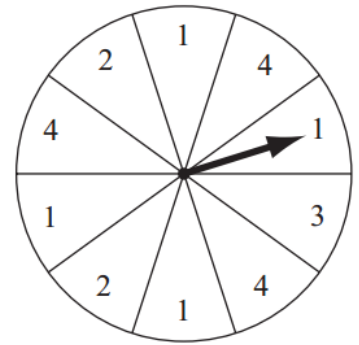
Answer: [2]

(b) Calculate the probability that Claude is late to school.

Answer: [2]

Problem 6

The diagram shows a circular board, divided into 10 numbered sectors. When the arrow is spun, it is equally likely to stop in any sector.



- (a) Complete the table below which shows the probability of the arrow stopping at each number.

[2]

Number	1	2	3	4
Probability		0.2		0.3

- (b) The arrow is spun once. Find

- (i) the most likely number it will stop at,

Answer: [1]

- (ii) the probability of a number less than 4.

Answer: [1]

- (c) The arrow is spun twice.
Find the probability that

- (i) both numbers are 2,

Answer: [1]

- (ii) the first number is 3 and the second number is 4,

Answer: [1]

- (iii) the two numbers add up to 4.

Answer: [1]

- (d) The arrow is spun several times until it stops at a number 4.
Find the probability that this happens on the third spin.

Answer: [2]

Problem 7

A bag contains 40 balls, some of which are red, some of which are yellow and the rest are black. The probabilities of drawing a red ball and a yellow ball at random from the bag are $\frac{1}{4}$ and $\frac{2}{5}$ respectively.

(a) Find the probability of drawing a black ball at random from the bag.

Answer: [1]

(b) $(2x + 1)$ red and $(x + 2)$ yellow balls are added to the bag while $(x - 3)$ black balls are **removed** from the bag.

Show that the **total number of balls** in the bag now is $2x + 46$. [3]

(c) The probability of drawing a yellow ball at random from the bag now is $\frac{3}{7}$.
Form an equation in terms of x and solve it.

Answer: [3]

(d) Find the number of yellow balls in the bag now.

Answer: [1]

Problem 8

A bag contains 10 red marbles, 9 blue marbles and 7 yellow marbles.

Three marbles are drawn one after another, **without replacement**.

By drawing a tree diagram or otherwise, find the probability of obtaining

(a) a red and two blue marbles in that order,

Answer: [2]

(b) a red, a yellow and a blue marble in that order,

Answer: [2]

(c) three balls of different colours.

Answer: [2]

Appropriate diagram [2]

Problem 9

There are x left shoes and 7 right shoes in a dark cupboard.

At random, Harper **takes two shoes** from the cupboard.

The probability that Harper takes one left shoe and one right shoe is $\frac{7}{13}$.

(a) Show that $x^2 - 13x + 42 = 0$.

Answer: [3]

(b) Solve $x^2 - 13x + 42 = 0$ using [appropriate] method.

Answer: [2]

(c) Find the two probabilities when Harper takes two right shoes.

Answer: [2]