Probability
Difficulty: Hard

Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Probability
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 1

Time allowed: **83 minutes**

Score: **/72**

Percentage: **/100**

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

(a) A bag contains red beads and green beads.
There are 80 beads altogether.
The probability that a bead chosen at random is green is 0.35 .

(i) Find the number of red beads in the bag. [2]

(ii) Marcos chooses a bead at random and replaces it in the bag.
He does this 240 times.

Find the number of times he would expect to choose a green bead. [1]

(b) A different bag contains 2 blue marbles, 3 yellow marbles and 4 white marbles.
Huma chooses a marble at random, notes the colour, then replaces it in the bag.
She does this three times.

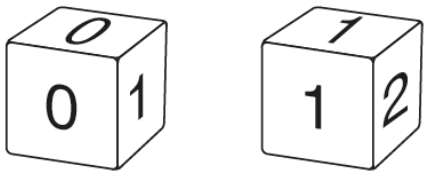
Find the probability that

(i) all three marbles are yellow, [2]

(ii) all three marbles are different colours. [3]

(c) Another bag contains 2 green counters and 3 pink counters.
Teresa chooses three counters at random **without** replacement.

Find the probability that she chooses more pink counters than green counters. [4]



A *B*

The diagram shows two fair dice.
The numbers on dice *A* are 0, 0, 1, 1, 1, 3.
The numbers on dice *B* are 1, 1, 2, 2, 2, 3.
When a dice is rolled, the score is the number on the top face.

(a) Dice *A* is rolled once.

Find the probability that the score is not 3. [1]

(b) Dice *A* is rolled twice.

Find the probability that the score is 0 both times. [2]

(c) Dice *A* is rolled 60 times.

Calculate an estimate of the number of times the score is 0. [1]

(d) Dice A and dice B are each rolled once.
The product of the scores is recorded.

(i) Complete the possibility diagram.

Dice B \ Dice A	0	0	1	1	1	3
3	0	0				
2	0	0				
2	0	0				
2	0	0				
1	0	0				
1	0	0	1	1	1	3

[2]

(ii) Find the probability that the product of the scores is

(a) 2, [1]

(b) greater than 3. [1]

(e) Eva keeps rolling dice B until 1 is scored.

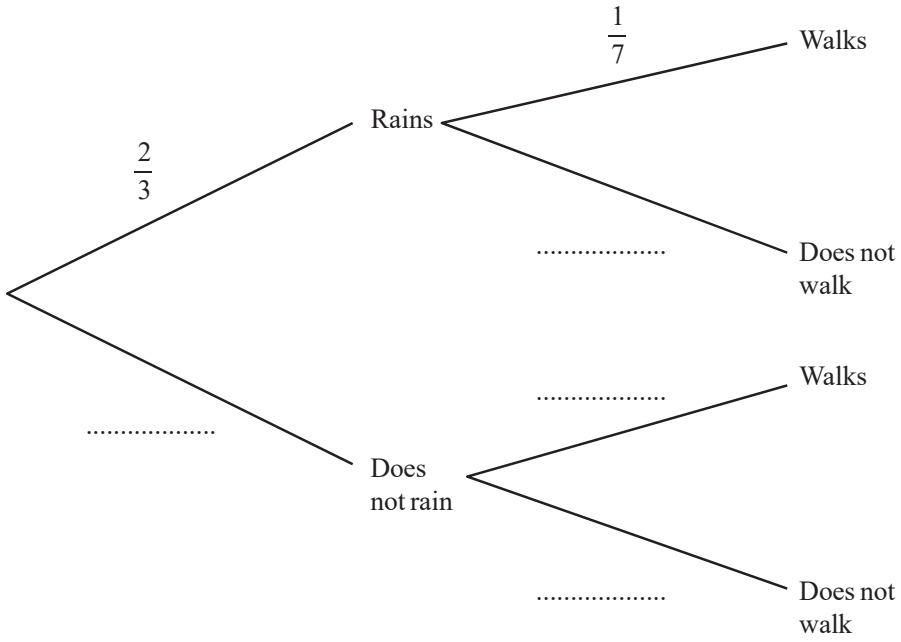
Find the probability that this happens on the 5th roll. [2]

Each morning the probability that it rains is $\frac{2}{3}$.

If it rains, the probability that Asha walks to school is $\frac{1}{7}$.

If it does not rain, the probability that Asha walks to school is $\frac{4}{7}$.

(a) Complete the tree diagram.



[2]

(b) Find the probability that it rains and Asha walks to school. [2]

(c) (i) Find the probability that Asha does not walk to school. [3]

(ii) Find the expected number of days Asha does not walk to school in a term of 70 days. [2]

(d) Find the probability that it rains on exactly one morning in a school week of 5 days. [2]

Ravi spins a biased 5-sided spinner, numbered 1 to 5.
The probability of each number is shown in the table.

Number	1	2	3	4	5
Probability	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	x	x

(a) Find the value of x. [3]

(b) Ravi spins the spinner once.

Find the probability that the number is 2 or 3. [2]

(c) Ravi spins the spinner twice.

Find the probability that

(i) the number is 2 both times, [2]

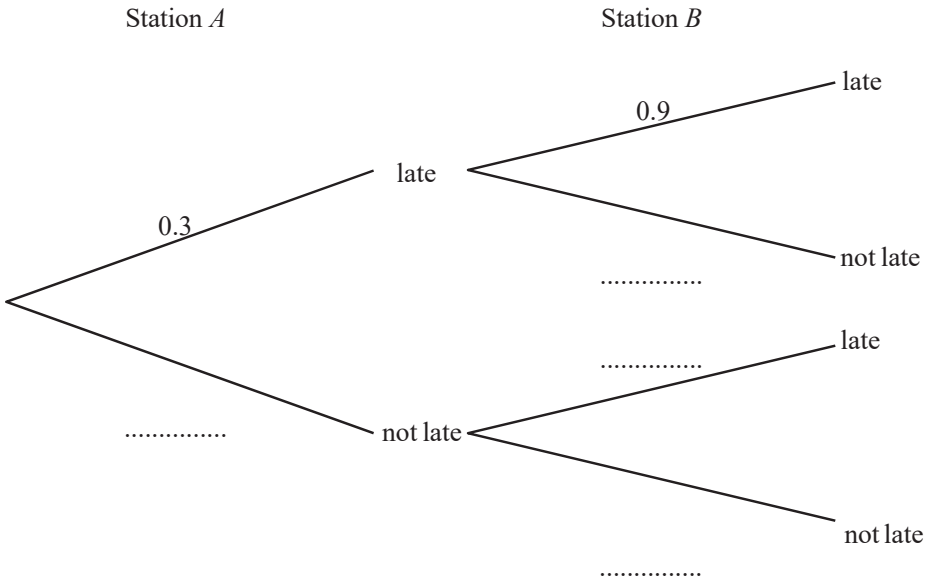
(ii) the sum of the numbers is 3. [3]

(d) Ravi spins the spinner 72 times.

Calculate how many times he expects the number 1. [1]

A train stops at station A and then at station B.
If the train is late at station A, the probability that it is late at station B is 0.9 .
If the train is not late at station A, the probability that it is late at station B is 0.2 .
The probability that the train is late at station A is 0.3 .

(a) Complete the tree diagram. [2]



(b) (i) Find the probability that the train is late at one or both of the stations. [3]

(ii) This train makes 250 journeys.

Find the number of journeys that the train is expected to be late at one or both of the stations.

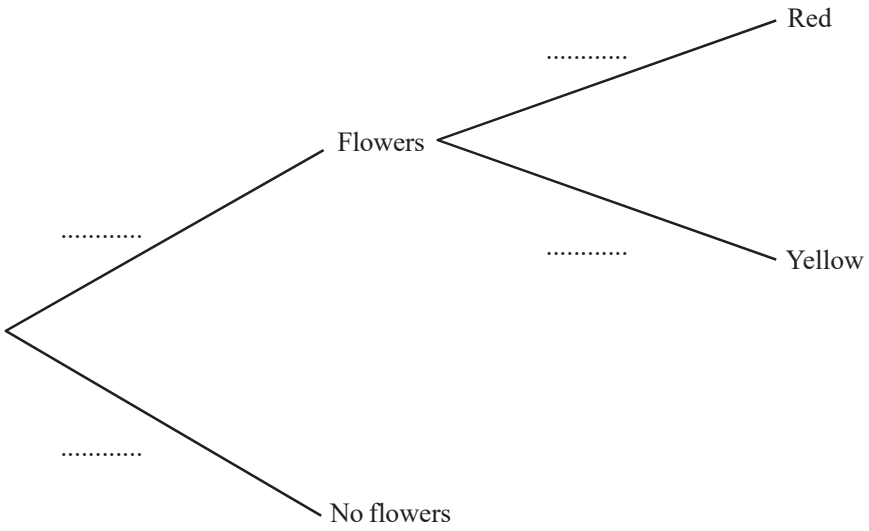
[1]

(c) The train continues to station C.
The probability that it is late at all 3 stations is 0.27 .

Describe briefly what this probability shows. [1]

The probability that a plant will produce flowers is $\frac{7}{8}$.
The flowers are either red or yellow.
If the plant produces flowers, the probability that the flowers are red is $\frac{3}{4}$.

(a) (i) Complete the tree diagram by writing a probability beside each branch. [2]



(ii) Calculate the probability that a plant, chosen at random, will produce red flowers. [2]

(iii) Two plants are chosen at random.

Calculate the probability that both will produce red flowers. [2]

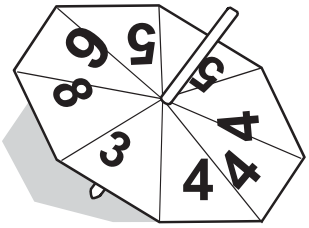
(b) Alphonse buys 200 of these plants.

Calculate the number of plants that are expected to produce flowers. [2]

(c) Gabriel has 1575 plants with red flowers.

Estimate the total number of plants that Gabriel has. [2]

Sandra has a fair eight-sided spinner.
The numbers on the spinner are 3, 4, 4, 4, 5, 5, 6 and 8.
Sandra spins the spinner twice and records each number it lands on.



Find the probability that

(a) both numbers are 8, [2]

(b) the two numbers are not both 8, [1]

(c) one number is odd and one number is even, [2]

(d) the total of the two numbers is at least 13, [3]

(e) the second number is bigger than the first number. [3]