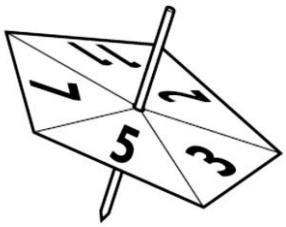
Paper – 22.1

Q1.

A fair five-sided spinner is numbered using the prime numbers 2, 3, 5, 7 and 11.

(a) In a game, players spin it twice and add the two numbers obtained.

(i) Complete the possibility diagram. [1]



+	2	3	5	7	11
2	4	5			
3					
5			10	12	
7			12		
11					

(ii) Find the probability that the total of the two numbers is

(a) a prime number, [1]

(b) a perfect square. [1]

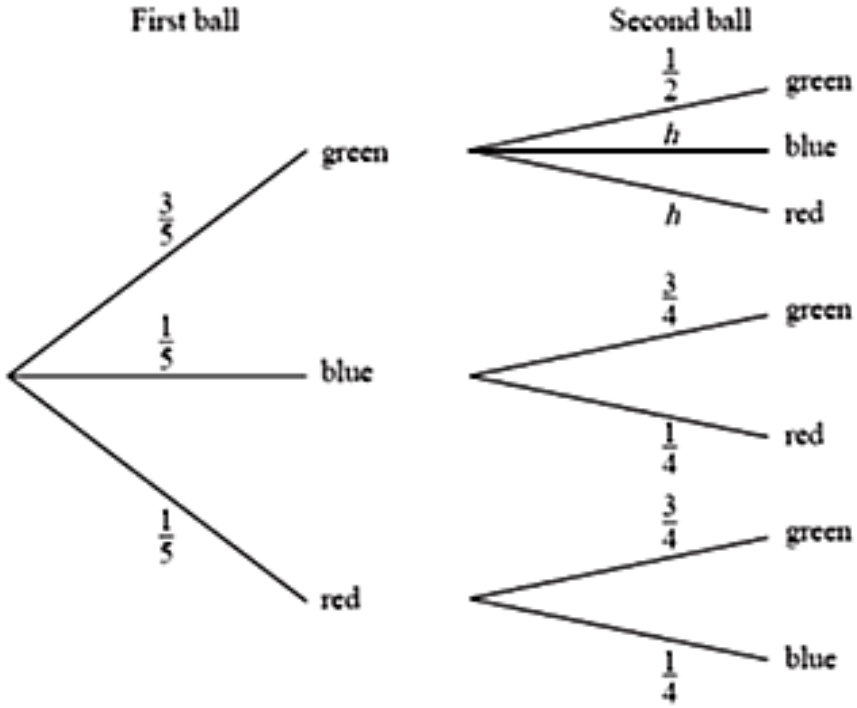
(b) In another game, players spin it twice and multiply the two numbers obtained. Without drawing another possibility diagram, write down the probability that this product is a prime number. [1]

Q2.

A bag contains 1 red, 1 blue and 3 green balls. Two balls are taken from the bag, at random, without replacement.

The tree diagram that represents these events is drawn below.

(a) Write down the value of h. [1]



(b) Expressing each answer in its simplest form. Calculate the probability that

(i) Both balls are green, [1]

(ii) Both balls are blue, [1]

(iii) Neither ball is green. [1]

Q3.

A bag contains red, green and yellow pegs. A peg is taken at random from the bag.

The probability that it is red is 0.35 and the probability that it is green is 0.4.

(a) Find the probability that it is

(i) Yellow, [1]

(ii) Not red. [1]

(b) Originally there were 16 green pegs in the bag. Find the total number of pegs. [1]

Q4.

In a group of 8 students there are 5 boys and 3 girls. Two students are chosen at random.

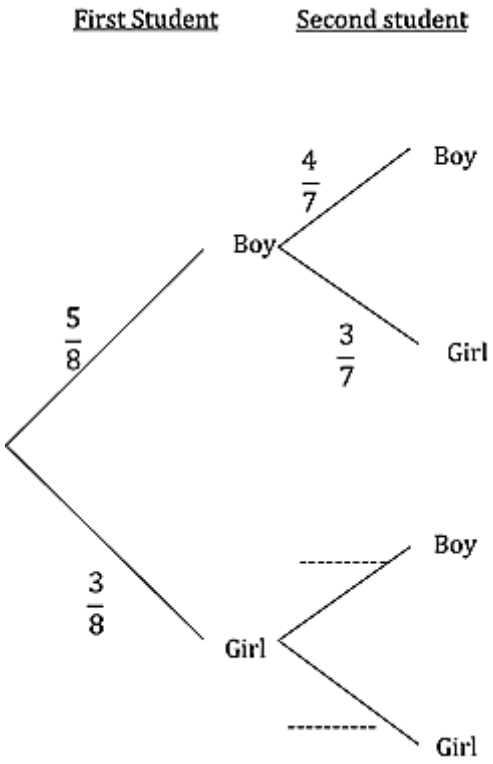
The tree diagram shows the possible outcomes and their probabilities.

(a) Complete the tree diagram. [1]

(b) Expressing each answer as a fraction in its lowest terms, find the probabilities that

(i) Two boys are chosen, [1]

(ii) At least one boy is chosen. [2]



Q5.

A bag contains 6 red counters and 4 blue counters.

Two counters are taken from the bag

at random, without replacement.

(a) Complete the tree diagram. [1]

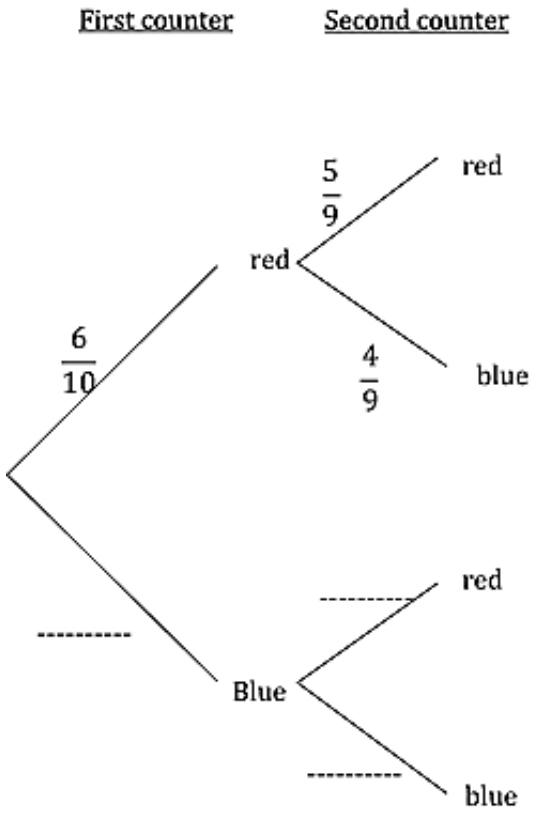
(b) Expressing each answer as a fraction

in its simplest form.

Calculate the probabilities that

both counters are the same colour.

[2]



Q6.

The probability the Catherine oversleeps in 0.4.

If she oversleeps, the probability that she cycles to School is 0.7.

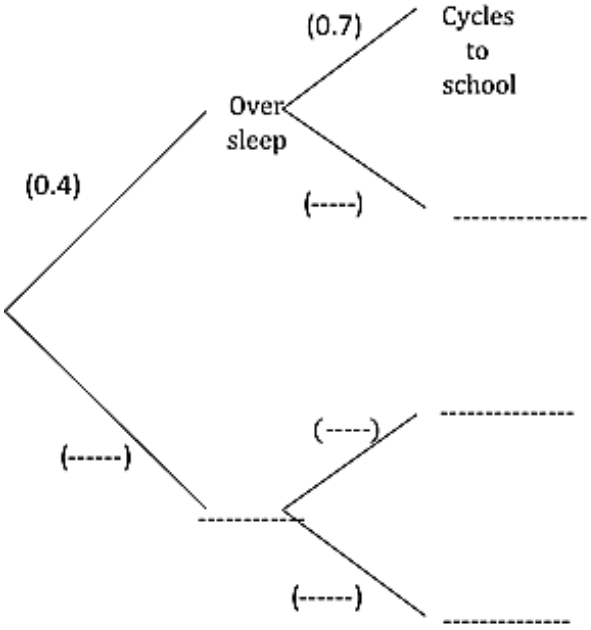
If she does not oversleep, the probability

that she cycles to school is 0.1.

(a) Complete the tree diagram to represent this information. [2]

(b) Calculate the probability that

Catherine cycles to school. [1]



Q7.

Four cards are marked with the numbers 1, 2, 3 and 4.
One card is chosen at random.
A second card is then chosen, at random, from the remaining three cards.
The sum of the numbers on the two chosen cards is calculated.

(a) Complete the table to show the possible outcomes. [1]

(b) What is the probability that the sum is less than 2?

Answer ..... [1]

(c) What is the probability that the sum is greater than 5?

Answer ..... [1]

Second card \ First card	1	2	3	4
1				
2				
3				
4				

Q8.

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Three cards, A, B and C are marked with the numbers 2, 3 and 4 respectively.
One card is chosen, at random.
A second card is then chosen, at random, from the remaining two cards.
The sum of the numbers on the two chosen cards is calculated.

(a) What is the probability that the sum is 3?

Answer ..... [1]

(b) Complete the table to show all the possible outcomes.
You may not need all the columns. [1]

First card	A								
Second card	B								
Sum	5								

(c) What is the probability that the sum is 7?

Answer ..... [1]

Answers: Paper 22.1

Q1ai) Q1aiia) 6/26 Q1aiib) 1/5

+	2	3	5	7	11
2	4	5	7	9	13
3	5		8	10	14
5	7	8	10	12	16
7	9	10	12	14	18
11	13	14	16	18	22

Q1b) 0

Q2a) $\frac{1}{4}$ Q2bi) $\frac{3}{10}$ Q2bii) 0 Q2biii) $\frac{1}{10}$ Q3ai) 0.25 Q3aii) 0.65 Q3b) 40

Q4a) $\frac{5}{7}, \frac{2}{7}$ Q4bi) $\frac{5}{14}$ Q4bii) $\frac{25}{28}$ Q5a) $\frac{4}{10}, \frac{4}{9}, \frac{6}{9}, \frac{3}{9}$ Q5b) $\frac{7}{15}$

Q6a) 0.6 , does not over sleep , 0.3 , walk to school , 0.1 , cycle to school , 0.9 , walk to school

Q7a) Q7b) 0 Q7c) 1/3

Second card \ First card	1	2	3	4
1		3	4	5
2	3		5	6
3	4	5		7
4	5	6	7	

Q8a) 0 Q8b) Q8c) 1/3

First card	A	A	B	B	C	C			
Second card	B	C	A	C	A	B			
Sum	5	6	5	7	6	7			