Revision F4 (November Exam) [51]

1.

Emma has a box of counters.
The counters are green, red or blue.
She picks a counter at random.
The table shows the probability that she picks a green counter and the probability that she picks a red counter.

Colour	Probability
Green	0.6
Red	0.25
Blue	

(a) What is the probability that Emma picks a blue counter?
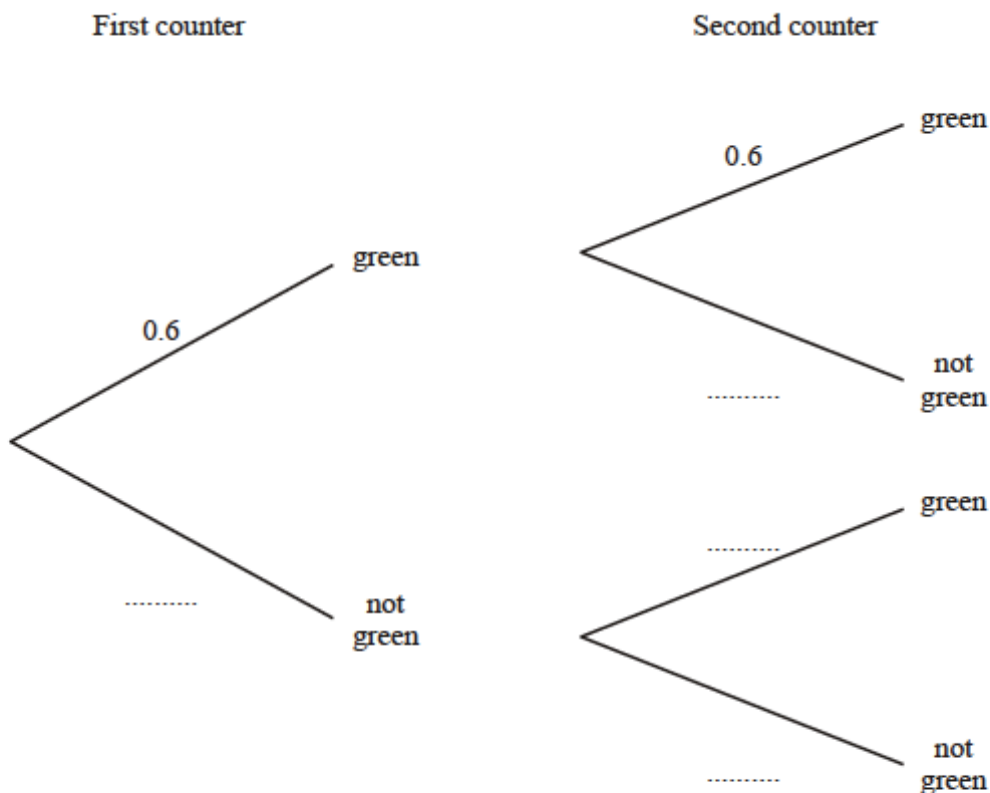
(2)

(b) There are 10 red counters in the box.

How many green counters are in the box?

(3)

(c) Emma picks a counter at random.
She replaces it in the box and then picks another counter at random.

(i) Copy and complete the tree diagram.

First counter   Second counter

(1)

(ii) What is the probability that at least one of the counters is green?

(3)

(Total 9 marks)

2.

John is going to make chocolate squares to sell.

There are just three ingredients, chocolate, peanut butter and crisped rice, mixed in the ratio 4 : 2 : 3 respectively.

(a) How much of each ingredient will he need to make 900g of mixture?

(b) A bar of chocolate weighs 200g and costs £2.50.
A jar of peanut butter contains 250g and costs £1.70.
A packet of crisped rice contains 300g and costs £2.00.

John makes 4.5kg of mixture, from which he can cut 100 chocolate squares.
He charges 60p for each square and sells all 100 squares.

How much **profit** does he make?

(Total 7 marks)

3.

A special savings account earns 10% per year compound interest.

(a)   Jill invests £2500 in the special account.
How much will she have in her account after 2 years?

(3)

(b)   James also invests in the special account.
After earning interest for one year, he has £1320 in his account.
How much money did James invest?

(3)
(Total 6 marks)

4.
A code is made up of five entries. The first entry is either the letter B or G.
The second and third entries are the final 2 digits of a person's date of birth.
The fourth and fifth entries are the first letter of the first name and surname.
    (a)   How many possible codes are there?
    (b)   A school of 1250 students wants to use this method to give unique codes to all students.
            Give one reason why this may not work.

(Total 3 marks)

5.
(a)   Solve the equation

$$4(x+3) = 9(x-2)$$

(3)

(b)   Solve these simultaneous equations

$$5x + 3y = 6$$
$$3x - 7y = 19$$

You **must** show your working.   Do **not** use trial and improvement.

(4)
(Total 7 marks)
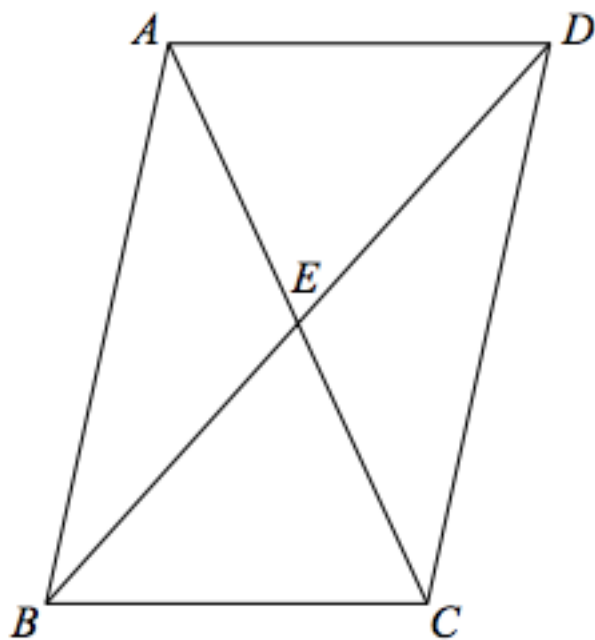
6.

In a group of 46 students

- 28 passed English
- 31 passed science
- 12 did not pass either.

Find the probability that a student selected at random from those who passed science also passed English.

(Total 4 marks)

7.

ABCD is a parallelogram.

E is the point where the diagonals *AC* and *BD* meet.

Prove that triangle *ABE* is congruent to triangle *CDE*.

(Total 3 marks)

8.

Charlie is inspecting chocolates at his chocolate factory.
He rejects chocolates that are the wrong size and also those that are the wrong shape.
The probability that a chocolate is the **correct size** is p.
The probability that a chocolate is the **correct shape** is q.
The size and shape of a chocolate are independent events.

(a)   Copy and complete the probabilities in the table.

Event	Probability
Chocolate is the correct size and the correct shape.	
Chocolate is the correct size and the wrong shape.	$p(1-q)$
Chocolate is the wrong size and the correct shape.	
Chocolate is the wrong size and the wrong shape.	

(2)

(b)   Show clearly that these probabilities have a total of 1.

(2)

(c)   The probability that a chocolate is both the correct size and the correct shape is 0.765
      The probability that a chocolate is the correct size is 0.9
      What is the probability that a chocolate is the correct shape?

(2)
(Total 6 marks)

9.

Jean enters an archery competition.

If it is raining the probability that she hits the target is 0.4.

If it is not raining the probability that she hits the target is 0.7

The probability that it rains on the day of the competition is 0.2

(a)   Draw a fully labelled tree diagram showing all the probabilities.

(3)

(b)   Calculate the probability that Jean hits the target with her first arrow in the competition.

(3)
(Total 6 marks)