1. A dice is biased.
   The table below shows the probability of obtaining each score when the dice is rolled.

Score	1	2	3	4	5	6
Probability	0.2	0.1	0.15	0.05	0.2	x

Find the value of x.

....

....

....

....

[2]

2. Scarlett has two fair spinners each with 4 sides.
   Each spinner has the numbers 1, 2, 3 and 4 on it.

   Each spinner is spun.
   Scarlett's score is the **difference** between the numbers shown on the spinners.

   (a) Complete the table to show all the possible scores.

Spinner A

		1	2	3	4
Spinner B	1			2	
	2	1	0		
	3				
	4	3			

[2]

   (b) Find the probability that

   (i) Scarlett's score is 3,

   ....

[1]

   (ii) Scarlett's score is less than 2.

   ....

[1]

3. Work out.

(a) 0.2 × 0.7

....

....

[1]

(b) $\frac{9}{10} \times \frac{1}{3}$

Give your answer in its simplest form.

....

....

....

[2]

4. Jason classifies the weather on any day as one of sunny, changeable, cloudy or stormy. The table shows the probability of each of these weather types.

sunny	changeable	cloudy	stormy
0.2	0.4	0.25	p

(a) Find the value of p.

....

[2]

(b) Use these probabilities to estimate how many sunny days should be expected in a month of 30 days.

....

[2]

5. Venus and Serena play tennis.
    The probability that Venus wins a match is 0.4. A match cannot be drawn.
    They play 2 matches.

    (a) Complete the tree diagram.

    First match   **Second match**

                                              Venus wins
                       ....
              Venus wins
        0.4
                       ....   Serena wins

                                              Venus wins
                       ....
              Serena wins
        ....
                       ....   Serena wins
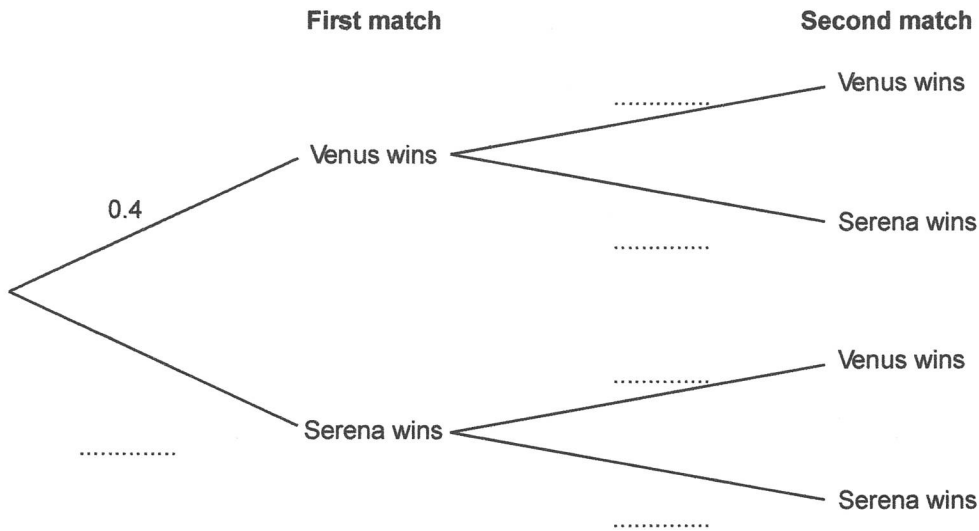
                                                              [2]

    (b) Calculate the probability that Serena wins both matches.

         ....

         ....
                                                              [2]

6. (a) (i)   Work out.

                $\frac{4}{5}$ of 30

                                            ....[2]

         (ii) Write $\frac{2}{14}$ as a fraction in its lowest terms.

                                            ....[1]

         (iii) Write 0.03 as a fraction.

                                            ....[1]

    (b) Work out.

                45 x 73

                                            ....

                                                              [3]

7. Emily is playing a game using two fair spinners.
The first is three-sided and numbered 1, 2, and 3.
The second is four-sided and numbered 1, 2, 3 and 4.

She spins both spinners and adds the numbers together.

(a) Complete the table below showing the different totals she can make.

[2]

+	1	2	3	4
1				
2	3			
3				7

(b) What is the probability that her total is 5 or more?

....

[2]

8. Work out.

(a) 0.6×0.3

....

....

[1]

(b) 2×-5

....

[1]

(c) $\dfrac{3}{5} \times \dfrac{1}{2}$

....

....

[1]

(d) 8^2

....

[1]

(e) 10^3

....
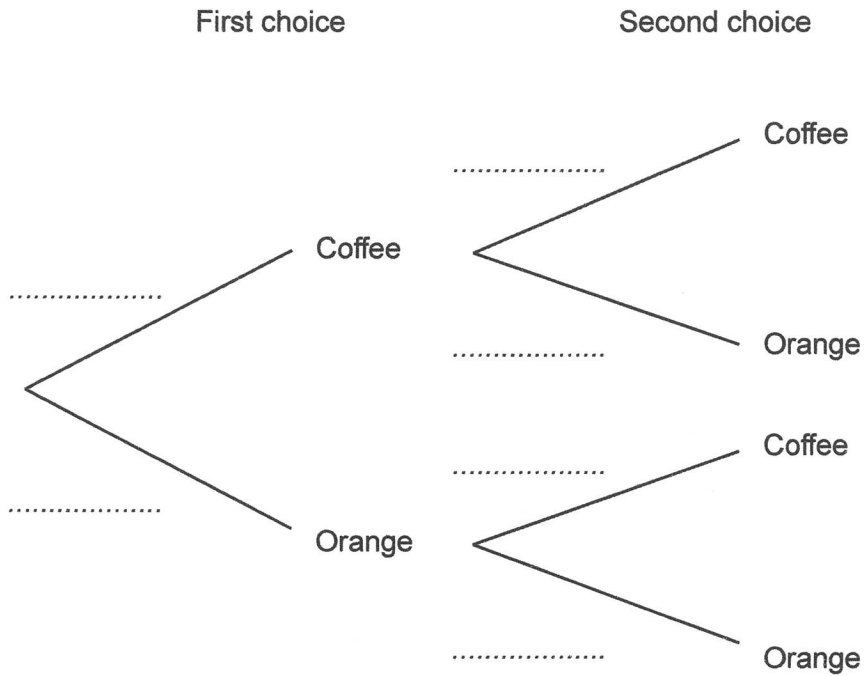
....

[1]

9.   Charlie has 10 bars of chocolate in a tin.

They are identical in size and shape.

Three of the bars are coffee flavoured, the others are orange flavoured.

Charlie chooses one bar at random and eats it. He then chooses a second bar at random.

(a)   Complete the tree diagram to show Charlie's choices.

First choice   Second choice

.... Coffee

Coffee

....

.... Orange

Coffee

....

Orange

.... Coffee

Orange

....

.... Orange

[3]

(b)   Calculate the probability that exactly one of the bars that Charlie chooses is coffee flavoured.

....

[3]

10. Ethan travels to and from work by train.

The probability that the train he travels to work on is delayed is 0.2.

If the train he travels to work on is delayed, the probability that the train he travels home on is also delayed is 0.9.

If the train he travels to work on is **not** delayed, the probability that the train he travels home on is delayed is 0.4.

(a) Complete the tree diagram to show this information.

To work   To home

.... delayed

.... delayed

.... not delayed

.... delayed

.... not delayed

.... not delayed

[3]
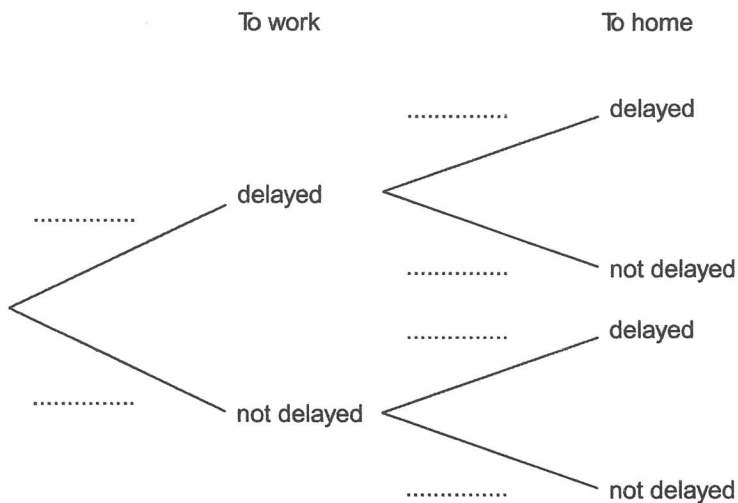
(b) Calculate the probability that, on one day, exactly one of Ethan's two trains is delayed.

....[3]

11. Work out.

(a) $\dfrac{3}{4} - \dfrac{1}{3}$

....[2]

(b) $\dfrac{3}{4} \div \dfrac{1}{3}$

Give your answer as a mixed number.

....[2]
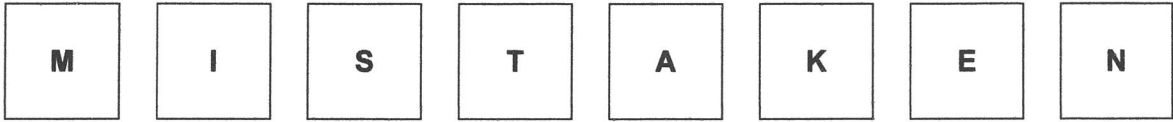
(c) $4\dfrac{3}{5} + 1\dfrac{7}{10}$

....[3]

12. The letters of the word MISTAKEN are written on separate cards.

The letters I, A and E are vowels. The letters M, S, T, K and N are consonants.
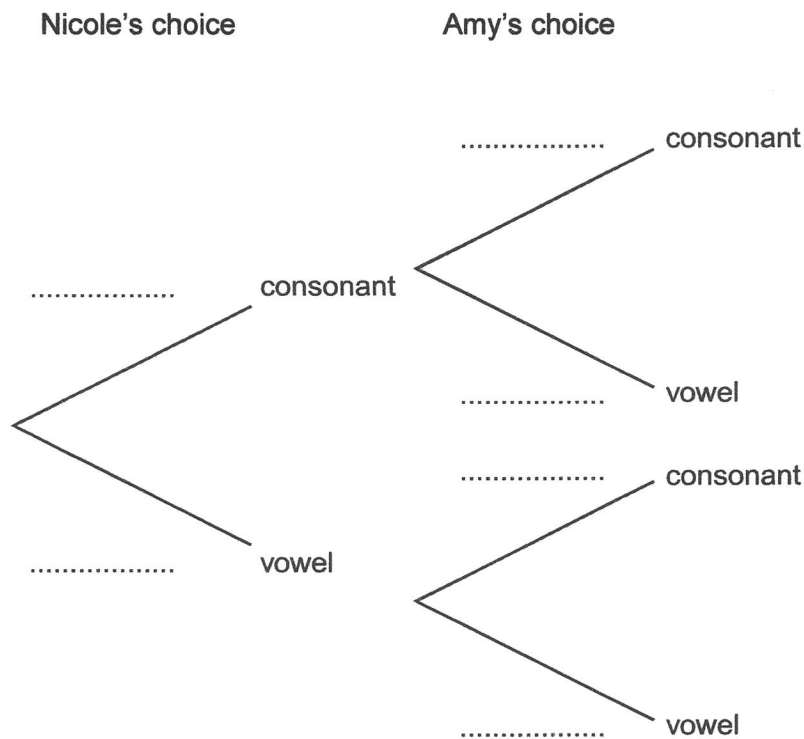
| M | I | S | T | A | K | E | N |

The cards are placed in a bag.
Nicole chooses a card at random and **does not** replace the card.
Amy then chooses a card at random.

(a) Complete the tree diagram to show the probabilities of choosing a vowel or consonant for Nicole and Amy.

Nicole's choice   Amy's choice

.... consonant

.... consonant

.... vowel

.... consonant

.... vowel

.... vowel

[3]

(b) Work out the probability that Nicole and Amy both choose a vowel or both choose a consonant.

....

[3]

13. A bowl contains 10 fruits.
    There are 3 pears, 5 apples and 2 oranges.
    Anna takes a fruit at random from the bowl to eat at lunchtime.
    Kieron then takes a fruit at random from the bowl.

    (a) Complete this tree diagram to show the probabilities of the fruits taken.

Anna's fruit   Kieron's fruit

```
                                              ............  pear
                          ............                      
                pear  <   ............        apple
          ............                         
                              ............    orange

                                              ............  pear
          ............                        
               apple  <   ............        apple
                              ............                  
                                              orange

                                              ............  pear
          ............                        
              orange  <   ............         apple
                              ............     
                                              orange
```

[3]
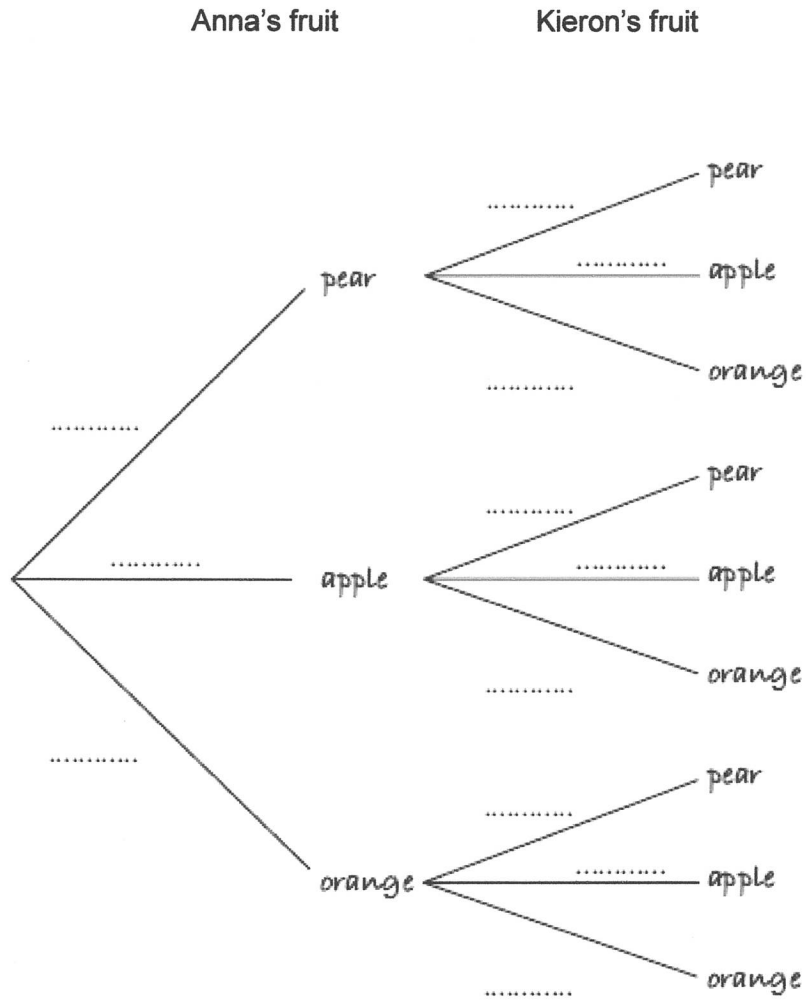
    (b) Calculate the probability that both Anna and Kieron take a pear.

    ....

[2]

    (c) Calculate the probability that at least one of Anna and Kieron takes an apple.

    ....

[3]

14. Abida has a bag of 9 sweets.
Four are strawberry, three are orange and two are lemon flavoured.

Abida chooses a sweet at random from the bag, eats it, and then chooses a second sweet at random.

(a) What is the probability that both sweets Abida chooses are strawberry flavour?

....

[3]

(b) What is the probability that the two sweets Abida chooses are different flavours from each other?

....

[4]

15. Niyaz deliberately gets the answers to these calculations wrong.
Explain what he has done wrong.
Do **not** do the full calculation.

(a) $23 \cdot 4 \times 1 \cdot 1 = 22 \cdot 74$

....

....

[1]

(b) $\dfrac{54 \cdot 6}{0 \cdot 4} = 21 \cdot 84$

....

....

[1]