Sets and Probability

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1) June 2010 V1



(ii) Find the probability that Abdul chooses box A and a black ball.

Answer(b)(ii) [2]

(iii) Find the probability that Abdul chooses a black ball.

Answer(b)(iii) [2]

(c) Tatiana chooses a box and then chooses **two** balls from this box at random (without replacement).

The probability that she chooses box A is $\frac{2}{3}$.

Find the probability that Tatiana chooses two white balls.

(1)

3 2 The diagram shows a spinner with six numbered sections. Some of the sections are shaded. Each time the spinner is spun it stops on one of the six sections. It is equally likely that it stops on any one of the sections. (a) The spinner is spun once. Find the probability that it stops on (i) a shaded section, Answer(a)(i) [1] (ii) a section numbered 1, Answer(a)(ii) [1] (iii) a shaded section numbered 1, Answer(a)(iii) [1] (iv) a shaded section or a section numbered 1. Answer(a)(iv) [1]

(b) The spinner is now spun twice.

Find the probability that the total of the two numbers is

(i) 20, Answer(b)(i) [2] **(ii)** 11. Answer(b)(ii) [2] The spinner stops on a shaded section. (c) (i) Find the probability that this section is numbered 2. Answer(c)(i) [1] (ii) The spinner stops on a section numbered 2. Find the probability that this section is shaded. Answer(c)(ii) [1] (d) The spinner is now spun until it stops on a section numbered 2. The probability that this happens on the *n*th spin is $\frac{16}{243}$. Find the value of *n*.

Answer(d) n = [2]

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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.

| Number | 1 | 2 | 3 | 4 |
|-------------|---|-----|---|-----|
| Probability | | 0.2 | | 0.3 |

WWW. 08 Mat Answer(b)(i)

[1]

[1]

(b) The arrow is spun once.

Find

(i) the most likely number,

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

Answer(b)(ii) [1]

(c) The arrow is spun twice.

Find the probability that

(i) both numbers are 2,

Answer(c)(i) [1]

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

Answer(c)(ii) [2]

(iii) the two numbers add up to 4.

Answer(c)(iii) [3]

(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(d) [2]

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4) November 2010 V2

- 9 A bag contains 7 red sweets and 4 green sweets. Aimee takes out a sweet at random and eats it. She then takes out a second sweet at random and eats it.
 - (a) Complete the tree diagram.



Answer(b)(ii) [3]

- (c) Aimee takes a third sweet at random. Calculate the probability that she has taken
 - (i) three red sweets,

Answer(c)(i) [2]

(ii) at least one red sweet.

Answer(c)(ii) [3]

5) November 2010 V3

6 Sacha either walks or cycles to school.

On any day, the probability that he walks to school is $\frac{3}{5}$.

(a) (i) A school term has 55 days.

Work out the expected number of days Sacha walks to school.

Answer(a)(i) [1]

(ii) Calculate the probability that Sacha walks to school on the first 5 days of the term.

Answer(a)(ii) [2]

(b) When Sacha walks to school, the probability that he is late is $\frac{1}{4}$. When he cycles to school, the probability that he is late is $\frac{1}{8}$.

(i) Complete the tree diagram by writing the probabilities in the four spaces provided.



[3]

(ii) Calculate the probability that Sacha cycles to school and is late.

Answer(b)(ii) [2]

(iii) Calculate the probability that Sacha is late to school.

Answer(b)(iii) [2]

6) June 2011 V1 2 In this question give all your answers as fractions. The probability that it rains on Monday is $\frac{3}{5}$. If it rains on Monday, the probability that it rains on Tuesday is $\frac{4}{7}$. $\frac{3}{7}$. If it does not rain on Monday, the probability that it rains on Tuesday is (a) Complete the tree diagram. Monday Tuesday - Rain Rain No rain - Rain No rain No rain [3] (b) Find the probability that it rains (i) on **both** days, Answer(b)(i) [2] (ii) on Monday but not on Tuesday, Answer(b)(ii) [2] (iii) on only one of the two days. Answer(b)(iii) [2] (c) If it does not rain on Monday and it does not rain on Tuesday, the probability that it does not alns.com W rain on Wednesday is Calculate the probability that it rains on **at least one** of the three days.

Answer(c) [3]

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7) June 2011 V3

- 7 Katrina puts some plants in her garden.
 The probability that a plant will produce a flower is ⁷/₁₀.
 If there is a flower, it can only be red, yellow or orange.
 When there is a flower, the probability it is red is ²/₃ and the probability it is yellow is ¹/₄.
 - (a) Draw a tree diagram to show all this information.

Label the diagram and write the probabilities on each branch.

Answer(a)

(b) A plant is chosen at random.

Find the probability that it will **not** produce a yellow flower.

(c) If Katrina puts 120 plants in her garden, how many orange flowers would she expect?

11111. Q8 MatAnswer(b)

Answer(c) [2]

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13

[3]

[5]

8) November 2011 V2

9 (a) Emile lost 2 blue buttons from his shirt.

A bag of spare buttons contains 6 white buttons and 2 blue buttons.

Emile takes 3 buttons out of the bag at random without replacement.

Calculate the probability that

(i) all 3 buttons are white,

Answer(a)(i) [3]

(ii) exactly one of the 3 buttons is blue.

Answer(a)(ii) [3]

(b) There are 25 buttons in another bag.

This bag contains *x* blue buttons.

Two buttons are taken at random without replacement.

The probability that they are both blue is $\frac{7}{100}$.

(i) Show that $x^2 - x - 42 = 0$.

Answer (b)(i)

(ii) Factorise $x^2 - x - 42$.

Answer(b)(ii) [2]

(iii) Solve the equation $x^2 - x - 42 = 0$.

 $Answer(b)(iii) x = \qquad \text{or } x = \qquad [1]$

(iv) Write down the number of buttons in the bag which are **not** blue.

Answer(b)(iv) [1]

[4]

9) November 2011 V3

9



The diagram shows two sets of cards.

- (a) One card is chosen at random from Set A and replaced.
 - (i) Write down the probability that the card chosen shows the letter M.
 - (ii) If this is carried out 100 times, write down the expected number of times the card chosen shows the letter M.

Answer(a)(i)

Answer(a)(ii) [1]

[1]

(b) Two cards are chosen at random, without replacement, from Set A.

Find the probability that both cards show the letter S.

Answer(b) [2]

(c) One card is chosen at random from Set A and one card is chosen at random from Set B.

Find the probability that exactly one of the two cards shows the letter U.

Answer(c) [3]

(d) A card is chosen at random, without replacement, from Set B until the letter shown is either I or U.

Find the probability that this does not happen until the 4th card is chosen.

Answer(d) [2]

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11) June 2012 V2

- 8 In all parts of this question give your answer as a fraction in its lowest terms.
 - (a) (i) The probability that it will rain today is $\frac{1}{3}$.

What is the probability that it will not rain today?

Answer(a)(i) [1]

____ Rain

- No rain

- Rain

No rain

(ii) If it rains today, the probability that it will rain tomorrow is $\frac{2}{5}$.

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

Rain

- No rain 🚽

Complete the tree diagram.

Today

Tomorrow

.....

WWW. 08 // Answer(b)

(b) Find the probability that it will rain on at least one of these two days.

- (c) Find the probability that it will rain on only one of these two days.
 - Answer(c) [3]

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[2]

[3]



(d) Give your answers to this part correct to 4 decimal places.

Two of the 240 passengers are chosen at random.

Find the probability that

(i) they are both on holiday,

Answer(d)(i) [2]

(ii) exactly one of the two passengers is on holiday.

Answer(d)(ii) [3]

(e) Give your answer to this part correct to 4 decimal places.

Two passengers are chosen at random from those on holiday.

Find the probability that they both hire a car.

Answer(e) [3]

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13) November 2012 V1

- **3** 90 students are asked which school clubs they attend.
 - $D = \{$ students who attend drama club $\}$
 - $M = \{$ students who attend music club $\}$
 - $S = \{$ students who attend sports club $\}$
 - 39 students attend music club.
 - 26 students attend exactly two clubs.
 - 35 students attend drama club.



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- (a) Write the four missing values in the Venn diagram.
- (b) How many students attend
 - (i) all three clubs,

(ii) one club only?

- Answer(b)(i) [1]
- Answer(b)(ii) [1]

- (c) Find
 - (i) $n(D \cap M)$,

Answer(c)(i) [1]

(ii) $n((D \cap M) \cap S')$.

Answer(c)(ii) [1]

[4]

(d) One of the 90 students is chosen at random.

Find the probability that the student

(i) only attends music club,

Answer(d)(i) [1]

(ii) attends both music and drama clubs.

Answer(d)(ii) [1]

(e) Two of the 90 students are chosen at random without replacement.

Find the probability that

(i) they both attend all three clubs,

Answer(e)(i) [2]

(ii) one of them attends sports club only and the other attends music club only.

Answer(e)(ii) [3]

14) November 2012 V2

9

- (a) $\mathscr{C} = \{25 \text{ students in a class}\}$
 - $F = \{$ students who study French $\}$
 - $S = \{$ students who study Spanish $\}$

16 students study French and 18 students study Spanish.

2 students study neither of these.

E

.

(i) Complete the Venn diagram to show this information.

F

(ii) Find n(F').

(iii) Find $n(F \cap S)'$.

(iv) One student is chosen at random.

Find the probability that this student studies both French and Spanish.

.....

Answer(a)(iv) [1]

S

Answer(a)(ii)

Answer(a)(iii)

.....

(v) Two students are chosen at random without replacement.

Find the probability that they both study only Spanish.

Answer(a)(v)[2]

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[2]

[1]

[1]

(b) In another class the students all study at least one language from French, German and Spanish.

No student studies all three languages.

The set of students who study German is a proper subset of the set of students who study French.

4 students study both French and German.

12 students study Spanish but not French.

9 students study French but not Spanish.

A total of 16 students study French.

(i) Draw a Venn diagram to represent this information.

(ii) Find the total number of students in this class.

[4]

Answer(b)(ii) [1]

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15) November 2012 V3

7 (a)

Two discs are chosen at random without replacement from the five discs shown in the diagram.

- (i) Find the probability that both discs are numbered 2.
 - Answer(a)(i) [2]
- (ii) Find the probability that the numbers on the two discs have a total of 5.

Answer(a)(ii) [3]

(iii) Find the probability that the numbers on the two discs do not have a total of 5.

Answer(a)(iii) [1]

(b) A group of international students take part in a survey on the nationality of their parents.

- $E = \{$ students with an English parent $\}$ F E $F = \{$ students with a French parent $\}$ $n(\mathscr{E}) = 50, \ n(E) = 15, \ n(F) = 9 \text{ and } n(E \cup F)' = 33.$ (i) Find $n(E \cap F)$. Answer(b)(i) [1] (ii) Find $n(E' \cup F)$. Answer(b)(ii) [1] (iii) A student is chosen at random. Find the probability that this student has an English parent and a French parent. Answer(b)(iii) [1] (iv) A student who has a French parent is chosen at random. Find the probability that this student also has an English parent.
 - Answer(b)(iv) [1]

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17) June 2013 V3

- 6 In a box there are 7 red cards and 3 blue cards. A card is drawn at random from the box and is not replaced. A second card is then drawn at random from the box.
 - (a) Complete this tree diagram.



(b) Work out the probability that the two cards are of different colours. Give your answer as a fraction.

18) November 2013 V1

6



Prettie picks a card at random from the 11 cards above and does not replace it. She then picks a second card at random and does not replace it.

- (a) Find the probability that she picks
 - (i) the letter L and then the letter G,

(ii) the letter E twice,

(iii) two letters that are the same.

(b) Prettie now picks a third card at random.

Find the probability that the three letters

(i) are all the same,

Answer(*b*)(i)[2]

(ii) do not include a letter E,

(iii) include exactly two letters that are the same.

- 5
- (b) The probability that Chaminda uses the internet on any day is $\frac{3}{5}$. The probability that Niluka uses the internet on any day is $\frac{3}{4}$.
 - (i) Complete the tree diagram.



(ii) Calculate the probability, that on any day, at least one of the two students uses the internet.

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(iii) Calculate the probability that Chaminda uses the internet on three consecutive days.

4



In the Venn diagram, $\mathscr{E} = \{$ children in a nursery $\}$

 $B = \{$ children who received a book for their birthday $\}$

 $T = \{$ children who received a toy for their birthday $\}$

 $P = \{$ children who received a puzzle for their birthday $\}$

x children received a book and a toy and a puzzle. 6 children received a toy and a puzzle.

(a) 4 children received a book and a toy.5 children received a book and a puzzle.7 children received a puzzle but not a book and not a toy.

Complete the Venn diagram above.

(b) There are 40 children in the nursery.

Using the Venn diagram, write down and solve an equation in x.

Answer(b)

[3]

(c) Work out

(i) the probability that a child, chosen at random, received a book but not a toy and not a puzzle,

| | | | Answer(c)(i)[1] |
|-----|---------------|--|-----------------------------|
| | (ii) | the number of children who received a book a | and a puzzle but not a toy, |
| | | | Answer(c)(ii) [1] |
| (| (iii) | n(<i>B</i>), | |
| | | | Answer(c)(iii) [1] |
| | (iv) | $n(B \cup P),$ | |
| | | | Answer(c)(iv) |
| | (v) | $n(B \cup T \cup P)'.$ | |
| | | | $Answer(c)(v) \qquad [1]$ |
| (d) | | | P |
| | Sha | ade the region $B \cap (T \cup P)'$. | [1] |

21) June 2014 V1

- 6 (a) A square spinner is biased.
 - The probabilities of obtaining the scores 1, 2, 3 and 4 when it is spun are given in the table.

| Score | 1 | 2 | 3 | 4 |
|-------------|-----|-----|-----|-----|
| Probability | 0.1 | 0.2 | 0.4 | 0.3 |

- (i) Work out the probability that on one spin the score is 2 or 3.
 - *Answer(a)*(i)[2]

(ii) In 5000 spins, how many times would you expect to score 4 with this spinner?

(iii) Work out the probability of scoring 1 on the first spin and 4 on the second spin.

(b) In a bag there are 7 red discs and 5 blue discs.From the bag a disc is chosen at random and not replaced.A second disc is then chosen at random.

Work out the probability that at least one of the discs is red. Give your answer as a fraction.

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22) June 2014 V2

- 9 If the weather is fine the probability that Carlos is late arriving at school is $\frac{1}{10}$. If the weather is not fine the probability that he is late arriving at school is $\frac{1}{3}$. The probability that the weather is fine on any day is $\frac{3}{4}$.
 - (a) Complete the tree diagram to show this information.



23) June 2014 V3

6 In this question, give all your answers as fractions.



The letters of the word **NATION** are printed on 6 cards.

(a) A card is chosen at random. Write down the probability that (i) it has the letter **T** printed on it, (ii) it does not have the letter **N** printed on it, (iii) the letter printed on it has no lines of symmetry. (b) Lara chooses a card at random, replaces it, then chooses a card again. Calculate the probability that only one of the cards she chooses has the letter **N** printed on it. Answer(b)[3] (c) Jacob chooses a card at random and does not replace it. He continues until he chooses a card with the letter **N** printed on it. Find the probability that this happens when he chooses the 4th card. www.Q8 Maths.com

10 Kenwyn plays a board game.

Two cubes (dice) each have faces numbered 1, 2, 3, 4, 5 and 6. In the game, a **throw** is rolling the **two** fair 6-sided dice and then adding the numbers on their top faces. This total is the number of spaces to move on the board. For example, if the numbers are 4 and 3, he moves 7 spaces.

- (a) Giving each of your answers as a fraction in its simplest form, find the probability that he moves
 - (i) two spaces with his next throw,

Answer(*a*)(i) [2]

(ii) ten spaces with his next throw.

(b) What is the most likely number of spaces that Kenwyn will move with his next throw? Explain your answer.

Answer(b) because

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To win the game he must move **exactly** to the 100th space. Kenwyn is on the 97th space. If his next throw takes him to 99, he has to move back to 96. If his next throw takes him over 100, he stays on 97.

Find the probability that he reaches 100 in either of his next two throws.

- 4 Yeung and Ariven compete in a triathlon race. The probability that Yeung finishes this race is $\frac{3}{5}$. The probability that Ariven finishes this race is $\frac{2}{3}$.
 - (a) (i) Which of them is more likely to finish this race? Give a reason for your answer.

Answer(a)(i) because

[1]

(ii) Find the probability that they both finish this race.

(iii) Find the probability that only one of them finishes this race.

- (b) After the first race, Yeung competes in two further triathlon races.
 - (i) Complete the tree diagram.



 $Answer(b)(\Pi) \dots [2$

(iii) Calculate the probability that Yeung finishes at least one of his races.

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26) June 2015 V1

4 30 students were asked if they had a bicycle (B), a mobile phone (M) and a computer (C). The results are shown in the Venn diagram.



27) June 2015 V2

- Gareth has 8 sweets in a bag.4 sweets are orange flavoured, 3 are lemon flavoured and 1 is strawberry flavoured.
 - (a) He chooses two of the sweets at random.

Find the probability that the two sweets have different flavours.

Answer(a) [4]

(b) Gareth now chooses a third sweet.

Find the probability that **none** of the three sweets is lemon flavoured.

28) June 2015 V3



(c) Three of the cards are chosen at random, without replacement.

Find the probability that the cards do not show the letter *C*.

2 (a) x is an integer.

 $\mathscr{E} = \{x: 1 \le x \le 10\}$

- $A = \{x: x \text{ is a factor of } 12\}$
- $B = \{x: x \text{ is an odd number}\}\$
- $C = \{x: x \text{ is a prime number}\}$
- (i) Complete the Venn diagram to show this information.



(ii) Use set notation to complete each statement.



(iii) Find n(B).

[3]

[3]



30) March 2015 V2

6 In this question write any probability as a fraction.

Navpreet has 15 cards with a shape drawn on each card. 5 cards have a square, 6 cards have a triangle and 4 cards have a circle drawn on them.

(a) Navpreet selects a card at random.

Write down the probability that the card has a circle drawn on it.

Answer(a) [1]

(b) Navpreet selects a card at random and replaces it. She does this 300 times.

Calculate the number of times she expects to select a card with a circle drawn on it.

(c) Navpreet selects a card at random, replaces it and then selects another card.

Calculate the probability that

(i) one card has a square drawn on it and the other has a circle drawn on it,

Answer(c)(i)[3]

- (ii) neither card has a circle drawn on it.
- (d) Navpreet selects two cards at random, without replacement.

Calculate the probability that

(i) only one card has a triangle drawn on it,

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(ii) the two cards have different shapes drawn on them.

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31) March 2016 V2

- 3 (a) Davinder asked some people if they ate mangoes, pineapples or bananas last week.
 - $M = \{ \text{ people who ate mangoes } \}$ $P = \{ \text{ people who ate pineapples } \}$ $B = \{ \text{ people who ate bananas } \}$

The Venn diagram shows some of the information.



Write down the probability that this person also ate bananas.

.....[2]

32) June 2016 V2

5 Kiah plays a game.

The game involves throwing a coin onto a circular board. Points are scored for where the coin lands on the board.



If the coin lands on part of a line or misses the board then 0 points are scored. The table shows the probabilities of Kiah scoring points on the board with one throw.

| Points scored | 20 | 10 | 5 | 0 |
|---------------|----|-----|-----|------|
| Probability | x | 0.2 | 0.3 | 0.45 |

(a) Find the value of x.

(b) Kiah throws a coin fifty times.

Work out the expected number of times she scores 5 points.

(c) Kiah throws a coin two times.

Calculate the probability that

- (i) she scores either 5 or 0 with her first throw,
-[2]
- (ii) she scores 0 with her first throw and 5 with her second throw,

......[2]

28 Maths.com

(iii) she scores a total of 15 points with her two throws.

(d) Kiah throws a coin three times.

Calculate the probability that she scores a total of 10 points with her three throws.

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- 9 (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.
 - (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.

(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,

(ii) all three marbles are different colours.

.....[2]

.....[1]

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.....[2]

(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.



- The probability that it will rain tomorrow is $\frac{5}{8}$. 9 If it rains, the probability that Rafael walks to school is $\frac{1}{6}$. If it does not rain, the probability that Rafael walks to school is $\frac{7}{10}$. (a) Complete the tree diagram. Walks Rains Does not walk Walks Does not rain Does not walk [3] (b) Calculate the probability that it will rain tomorrow and Rafael walks to school.
 - (c) Calculate the probability that Rafael does not walk to school.

.....[3]

......[2]

10 (a) In 2017, the membership fee for a sports club was \$79.50. This was an increase of 6% on the fee in 2016.

Calculate the fee in 2016.

- \$[3]
- (b) On one day, the number of members using the exercise machines was 40, correct to the nearest 10. Each member used a machine for 30 minutes, correct to the nearest 5 minutes.

Calculate the lower bound for the number of minutes the exercise machines were used on this day.

- min [2]
- (c) On another day, the number of members using the exercise machines (E), the swimming pool (S) and the tennis courts (T) is shown on the Venn diagram.



- (i) Find the number of members using only the tennis courts.
- (ii) Find the number of members using the swimming pool.

(iv) Find $n(T \cap (E \cup S))$.

.....[1]

(iii) A member using the swimming pool is chosen at random.

Find the probability that this member also uses the tennis courts and the exercise machines.

-[2]
-[1]

35) June 2019 V2

- **3** The probability that Andrei cycles to school is *r*.
 - (a) Write down, in terms of *r*, the probability that Andrei **does not** cycle to school.
 - (b) The probability that Benoit **does not** cycle to school is 1.3 r. The probability that both Andrei and Benoit **do not** cycle to school is 0.4.
 - (i) Complete the equation in terms of r.

| $(\dots) \times (\dots) = 0.4$ | | () × () |) = 0.4 | [1] |
|--------------------------------|--|---------|---------|-----|
|--------------------------------|--|---------|---------|-----|

(ii) Show that this equation simplifies to $10r^2 - 23r + 9 = 0$.

(iii) Solve by factorisation $10r^2 - 23r + 9 = 0$.

(iv) Find the probability that Benoit **does not** cycle to school.

 $r = \dots$ or $r = \dots$ [3]

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[3]

<u>36) June 2019 V3</u> <u>8 (a) Ang</u>

- (a) Angelo has a bag containing 3 white counters and x black counters. He takes two counters at random from the bag, without replacement.
 - (i) Complete the following statement.

The probability that Angelo takes two black counters is

 $\frac{x}{x+3} \times \underline{\qquad}$

- (ii) The probability that Angelo takes two black counters is $\frac{7}{15}$.
 - (a) Show that $4x^2 25x 21 = 0$.

(b) Solve by factorisation. $4x^2 \quad 25x \quad 21 = 0$

(c) Write down the number of black counters in the bag.

......[1]

 $x = \dots$ or $x = \dots$ [3]

[2]

[4]

(b) Esme has a bag with 5 green counters and 4 red counters. She takes three counters at random from the bag without replacement.

Work out the probability that the three counters are all the same colour.



37) June 2020 V2

Tanya plants some seeds. 7

The probability that a seed will produce flowers is 0.8. When a seed produces flowers, the probability that the flowers are red is 0.6 and the probability that the flowers are yellow is 0.3.

(a) Tanya has a seed that produces flowers.

Find the probability that the flowers are not red and not yellow.



(ii) Find the probability that a seed chosen at random produces red flowers.

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(iii) Tanya chooses a seed at random.

Find the probability that this seed does not produce red flowers and does not produce yellow flowers.

(c) Two of the seeds are chosen at random.

Find the probability that one produces flowers and one does not produce flowers.

[3]

[3]

38) November 2020 V1

9 (a) There are 32 students in a class.

5 do not study any languages. 15 study German (*G*). 18 study Spanish (*S*).



- (i) Complete the Venn diagram to show this information.
- (ii) A student is chosen at random.

Find the probability that the student studies Spanish but not German.

(iii) A student who studies German is chosen at random.

Find the probability that this student also studies Spanish.

[1]

[2]

[1]

| (b) | A bag contains 54 red marbles and some blue marbles. 36% of the marbles in the bag are red. | |
|-----|---|------------|
| | Find the number of blue marbles in the bag. | |
| | | |
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| | | <i>∠</i>] |
| (c) | Another bag contains 15 red beads and 10 yellow beads. Ariana picks a bead at random, records its colour and replaces it in the bag. She then picks another bead at random. | |
| | (i) Find the probability that she picks two red beads. | |
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| | | 2] |
| | (ii) Find the probability that she does not pick two red beads. | |
| | | 1] |
| (d) | A box contains 15 red pencils, 8 yellow pencils and 2 green pencils. Two pencils are picked at random without replacement. | |
| | Find the probability that at least one pencil is red. | |
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| | www.Q8Maths.com | |
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| | | 0.7 |
| | | 3] |