

- 1 In a bag there are only red counters, blue counters, green counters and pink counters.
A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15	0.5	0.3

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

- (a) Complete the table.

$$P(G) = 0.2 + P(P) \quad \text{--- (1)}$$

$$P(G) + P(P) = 1 - (0.05 + 0.15) \quad \text{--- (2)}$$

$$= 0.8 \quad \text{(1)}$$

(1) into (2)

$$0.2 + P(P) + P(P) = 0.8$$

(2)

There are 18 blue counters in the bag. $P(P) = 0.3$, so $P(G) = 0.5$ (1)

- (b) Work out the total number of counters in the bag.

Total probability = 1.0, Total counters = x
Blue counter probability = 0.15, Blue counters = 18

$$\frac{x}{1} = \frac{18}{0.15}$$

$$x = \frac{18}{0.15} \quad \text{(1)}$$

120

$$= 120 \quad \text{(1)}$$

(2)

(Total for Question 1 is 4 marks)

2 There are 15 sweets in a jar.

4 of the sweets are red.

Jill takes at random a sweet from the jar.

(a) Write down the probability that the sweet is red.

$$\frac{\text{red sweets}}{\text{all sweets}} = \frac{4}{15} \text{ (1)}$$

$$\frac{4}{15}$$

(1)

There are only green counters and blue counters in a bag.

A counter is taken at random from the bag.

The probability that the counter is green is 0.3

(b) Find the probability that the counter is blue.

$$1 - 0.3 = 0.7 \text{ (1)}$$

All probabilities add up to 1,
The counter is either green or blue.

$$0.7$$

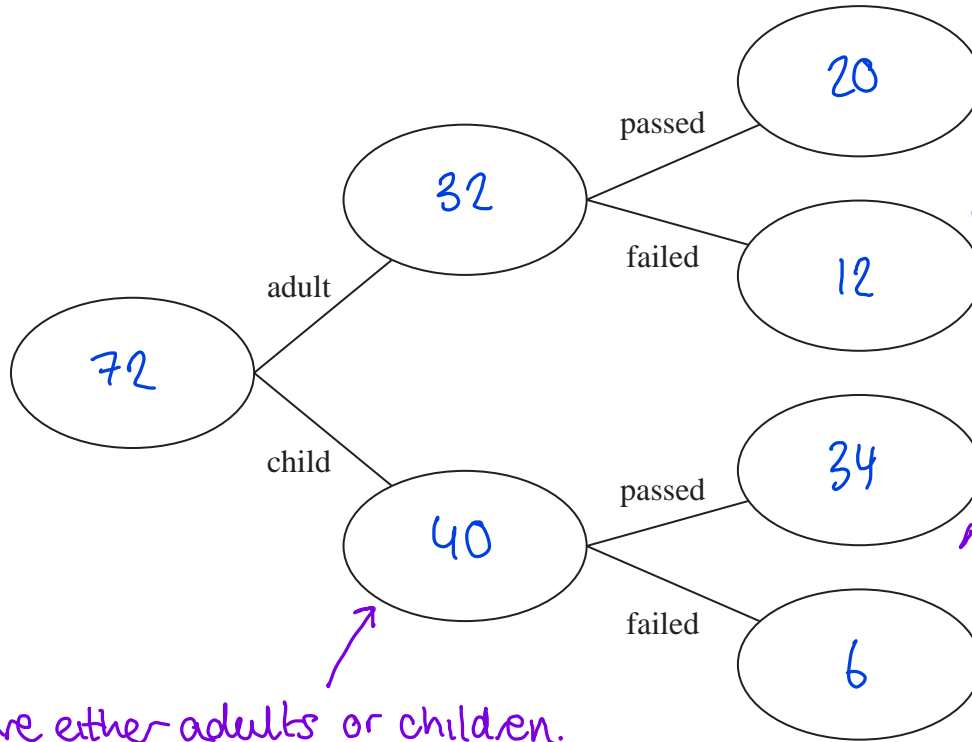
(1)

(Total for Question 2 is 2 marks)

3 72 people did a test.

20 of the 32 adults who did the test passed.
6 of the children who did the test failed.

(a) Use this information to complete the frequency tree.



The adults either passed or failed.
Number who failed = $32 - 20 = 12$

People are either adults or children.
Number of children = $72 - 32 = 40$

Children either passed or failed. Number who passed = $40 - 6 = 34$

(3)

(3)

One of these people is picked at random.

(b) Find the probability that this person is an adult who failed the test.

probability = $\frac{\text{adults who failed}}{\text{all that did the test}} = \frac{12}{72}$ (1)

$$\frac{12}{72}$$

Note: did not ask for simplest form.

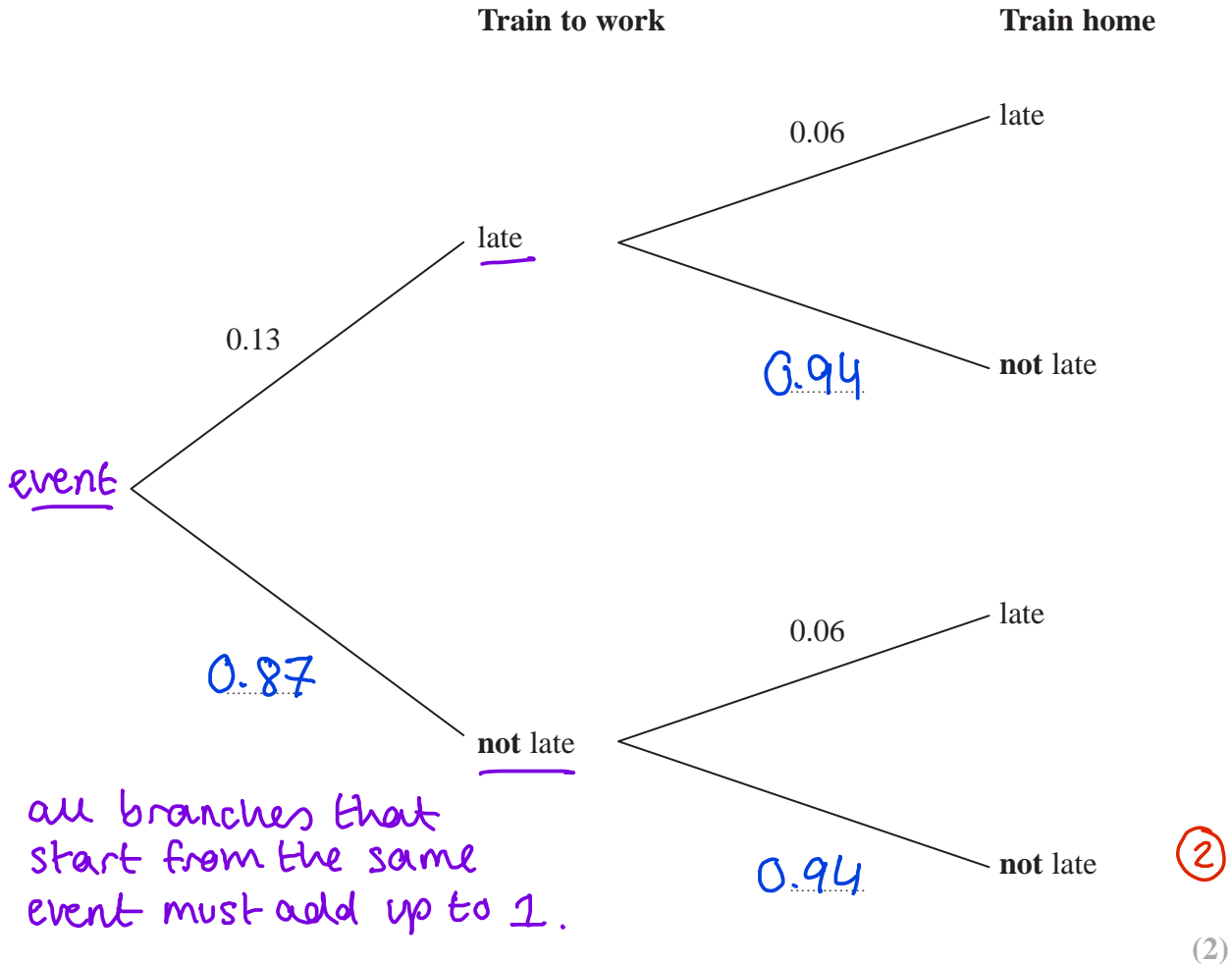
(2)

(Total for Question 3 is 5 marks)

- 4 Lorena gets a train at the same time each morning to go to work.
She gets a train at the same time each evening to come home.

The probability tree diagram shows the probabilities of each train arriving late.

- (a) Complete the probability tree diagram.



For a day that Lorena goes to work,

- (b) work out the probability that the train to work and the train home will both arrive late.

$$0.13 \times 0.06 = 0.0078$$

'and' means multiply probabilities
'or' means add probabilities

$$0.0078$$

(Total for Question 4 is 4 marks)

5 Here is a list of 8 letters.

In this case, A is the mode.

B C A A A A B A

(a) Write down the mode.

most common = appears the most

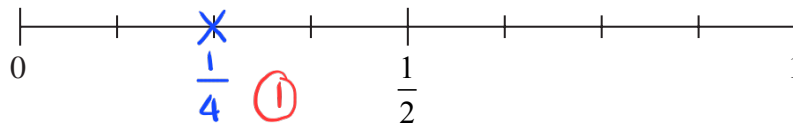
A (1)

One of the 8 letters is going to be picked at random.

(b) (i) On the probability scale, mark with a cross (×) the probability that this letter will be B.

B appears 2 times
out of 8 letters.

$$\frac{2}{8} = \frac{1}{4}$$



(1)

(ii) Find the probability that this letter will be C.

C only appears once out of 8 letters -

The probability of it getting
picked will be $\frac{1}{8}$.

$\frac{1}{8}$ (1)

(Total for Question 5 is 3 marks)

6 There are only blue counters, green counters, red counters and yellow counters in a bag.

The table shows the number of blue counters in the bag.

Colour	blue	green	red	yellow
Number of counters	30	45		

There is a total of 100 counters in the bag.

Ashin takes at random a counter from the bag.

(a) Find the probability that the counter is **not** blue.

Total counters that is not blue:

$$100 - 30 = 70 \quad (1)$$

$$\text{Probability} = \frac{\text{counter that is not blue}}{\text{total counters}} = \frac{70}{100} \quad (1) \quad \frac{70}{100} \quad (2)$$

The ratio of the number of blue counters to the number of green counters is 2:3

(b) Work out the number of green counters in the bag.

	Blue counter	:	Green Counter	
Ratio	2	:	3	
	$\times 15$		$\times 15$	
Number	30	:	45	$\frac{45}{100} \quad (1)$
				(2)

Bradley says,

“The number of red counters in the bag is the same as the number of yellow counters in the bag.”

(c) Can Bradley be correct?

Give a reason for your answer.

$$\text{Number of red + yellow} = (100 - 30 - 45) = 25$$

No, 25 cannot be divided by 2 to give a whole number. (1)

(1)

(Total for Question 6 is 5 marks)

- 7 (b) Work out the probability that the Keddie family will win both the sports quiz and the music quiz.

$$P(\text{win sports}) = 0.3$$

$$P(\text{win music}) = 0.35$$

$$\begin{aligned} P(\text{win both}) &= 0.3 \times 0.35 \quad (1) \\ &= 0.105 \quad (1) \end{aligned}$$

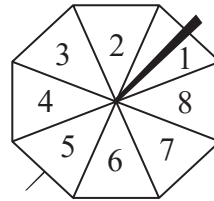
if P(A) 'AND' P(B) = we multiply
if P(A) 'OR' P(B) = we add up

$$0.105$$

(2)

(Total for Question 7 is 2 marks)

8 Here is a fair ordinary dice and a fair 8-sided spinner.



Charlie throws the dice once and spins the spinner once.

Is Charlie more likely to get

a number less than 3 on the dice
or a number greater than 5 on the spinner?

You must show all your working.

• Numbers on dice : 1, 2, 3, 4, 5, 6

Numbers less than 3 : 1, 2

Probability of getting number less than 3 : $\frac{2}{6}$ (1)

• Numbers on spinner : 1, 2, 3, 4, 5, 6, 7, 8

Numbers greater than 5 : 6, 7, 8

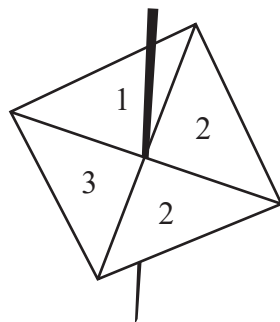
Probability of getting number greater than 5 : $\frac{3}{8}$ (1)

Comparing probability :

$\frac{2 \times 4}{6 \times 4} : \frac{3 \times 3}{8 \times 3} \rightarrow \frac{8}{24} : \frac{9}{24}$. \therefore Charlie is more likely to get number greater than 5 on the spinner. (1)

(Total for Question 8 is 3 marks)

9 Here is a 4-sided spinner.



Samina spins the spinner once.

(a) Choose the word that best describes the probability that the spinner lands on 2

impossible	unlikely	evens	likely	certain
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$$P(2) = \frac{2}{4} = \frac{1}{2}$$

evens (1)

(1)

(b) Choose the word that best describes the probability that the spinner lands on a number less than 4

impossible	unlikely	evens	likely	certain
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All the numbers on the spinner are less than 4

certain (1)

(1)

Ralph rolls a biased dice once.

The probability that he gets the number 5 is 0.4

(c) Work out the probability that Ralph does **not** get the number 5

$$\text{Total probability} = 1$$

$$P'(5) = 1 - 0.4 = 0.6$$

0.6 (1)

(1)

(Total for Question 9 is 3 marks)