

Probability – Checkpoint Sec 1 Math**1. No.14**

Mike throws an ordinary 6-sided dice and spins a coin at the same time.
One possible outcome is a 4 and a tail.

Work out the total number of possible outcomes.

$$P(4) \text{ on dice} = \frac{1}{6}$$

$$P(\text{tail}) \text{ on coin} = \frac{1}{2}$$

$$P(4) \text{ on dice and } P(\text{tail})$$

$$= \frac{1}{6} \times \frac{1}{2}$$

$$= \frac{1}{12}$$

$$\text{Total number of possible outcomes is } \underline{\underline{12}}$$

12 outcomes

[1]

2. No.18

A bag contains some counters.

Each counter is either red or green or yellow or blue.

A counter is taken from the bag at random.

The table shows the probabilities of taking a red counter, a green counter and a yellow counter.

Total probabilities of an event is 1

Colour	Red	Green	Yellow	Blue
Probability	0.25	0.5	0.15	

Tick (✓) to show if each of these statements is true, false or whether you cannot tell.

$$P(\text{red}) = 0.25 \left(\frac{1}{4} \right)$$

	True	False	Cannot tell
One quarter of the counters in the bag are red.	☒	☐	☐
The bag contains 100 counters altogether.	☐	☐	☒
The bag contains more blue counters than yellow.	☐	☒	☐

$$\text{Blue Counters} = 1 - (0.25 + 0.5 + 0.15)$$

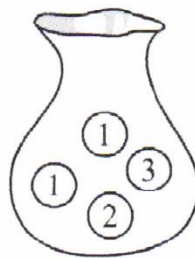
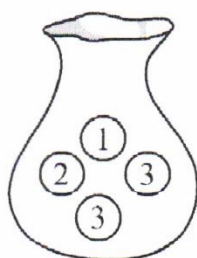
$$= 1 - 0.9 = 0.1 \text{ (false)}$$

[2]

3. No.23

Lily has two bags.

Each bag contains four counters, as shown in the diagram.



She picks **one** counter from each bag and adds together the numbers on the counters.

Work out the probability that the total of her numbers is **more** than 3

You may find the table useful.

	1	2	3	3
1	2	3	4	4
1	2	3	4	4
2	3	4	5	5
3	4	5	6	6

Probability More than 3 = $\frac{11}{16}$

$$= \frac{11}{16}$$

4, 4, 4, 4, 4, 4, 5, 5, 5, 6, 6

More than 3 = 11 counters = $\frac{11}{16}$
 Total probabilities = 16 outcomes =

$$\frac{11}{16}$$

[2]

4. No.9

Pierre rolls a dice with four sides, numbered 1 to 4
He also throws a coin with two outcomes, H or T.

List all the possible outcomes.

One has been done for you.

You may not need to use all the rows.

Dice	Coin
1	H
2	H
3	H
1	T
2	T
3	T
4	T

[1]

5. No.21

Hassan plays cricket.

The table shows the number of catches he makes in 50 games.

Number of catches	0	1	2	3	4	5
Frequency	8	11	12	13	4	2

- (a) Use the table to estimate the probability that he makes exactly **one** catch in the next game he plays.

$$P(1 \text{ catch}) = \frac{11}{50} \quad \frac{11}{50} \quad [1]$$

- (b) Write down the modal number of catches.

Modal number consider the highest frequency.

$$3 \quad [1]$$

- (c) Find the median number of catches.

Median = is the catches between 25th value and 26th value.

$$\frac{50}{2} = 25^{\text{th}}$$

$$\frac{50}{2} + 1 = 26^{\text{th}} \text{ value.}$$

$$2 \quad [1]$$

6. No.24

A box contains pens of different colours.

Yuri takes a pen from the box at random.

The probabilities of him taking a pen coloured red or blue or green are shown in the table.

Colour of pen	Red	Blue	Green
Probability	0.4	0.15	0.25

Yuri says,

‘There must be more than three different colours of pen in the box.’

Explain how the probabilities show Yuri is correct.

He is correct since the three colours have a probability of 0.8, thus more colours are needed. [1]
Total probabilities is equal to 1.

$$0.4 + 0.15 + 0.25 =$$

$$\begin{array}{r} 0.40 \\ + 0.15 \\ 0.25 \\ \hline 0.80 \end{array}$$

$$\begin{aligned} \text{More colours} &= 1 - 0.8 \\ &= \underline{\underline{0.2}} \end{aligned}$$

7. No.25

William plays a game.

He throws two fair dice.

His score is the **higher** of the two numbers shown on the dice.

The sample space diagram shows some of his possible scores.

		First dice					
		1	2	3	4	5	6
Second dice	1	1	2	3	4	5	6
	2	2	2	3	4	5	6
	3	3	3	3	4	5	6
	4	4	4	4	4	5	6
	5	5	5	5	5	5	6
	6	6	6	6	6	6	6

(a) Complete the sample space diagram.

[2]

(b) Work out the probability that his score is greater than 4

$$\frac{20}{36} = \frac{10}{18} = \frac{5}{9}$$

$$\frac{5}{9}$$

[1]

8. No.18

Some students choose their favourite drink from the six drinks shown in the table.
Some of the probabilities of the students choosing each drink are shown.

Drink	Tea	Coffee	Milk	Water	Cola	Orange
Probability	0.15	0.32	0.12	0.08	0.04	0.29

Three times as many students choose milk as choose cola.

Complete the table. $1 - (0.15 + 0.32 + 0.08 + 0.29)$

$$1 - 0.84 = 0.16$$

$$\text{milk} = 3 \times 0.04 = 0.12$$

$$\begin{aligned} \text{milk} &= 3x \\ \text{Cola} &= \frac{x}{4x} \end{aligned}$$

$$\frac{4x}{4} = \frac{0.16}{4} = 0.04$$

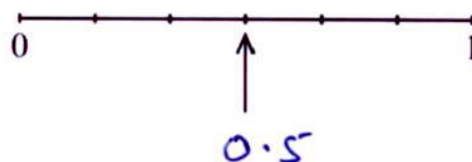
[2]

9. No.15

Mike throws a fair six-sided dice.



(a) The scale shows the probability of an event.

Tick (✓) **all** the events that could be represented by the arrow.

Getting an odd number on the dice.

☒

Getting the number 3 on the dice.

☐
Getting a number less than 4 on the dice.
☒

$$1, 2, 3 = \frac{3}{6} = 0.5 \checkmark$$

Odd numbers

$$1, 3, 5 = 3$$

Total numbers

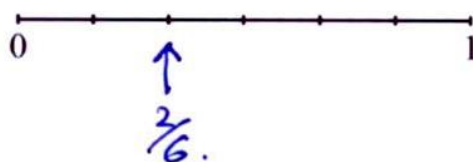
$$1, 2, 3, 4, 5, 6 = 6$$

$$\frac{3}{6} = 0.5 \checkmark$$

$$\text{Number } 3 = \frac{1}{6} = 0.16$$

$$0.16 \neq 0.5 \quad [1]$$

(b) Draw an arrow (↑) on the scale to show the probability of getting a 4 or a 5 on the dice.



↑ means '+'

$$P(4) = \frac{1}{6}$$

$$P(5) = \frac{1}{6}$$

$$P(4 \text{ or } 5) = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} \checkmark \quad [1]$$

10. No.16

- (a) Chen throws a coin 120 times.
He gets 54 heads.

Write down the relative frequency that Chen gets a head.

$$\frac{54}{120} = \frac{9}{20} = 0.45$$

$$\frac{54}{120} \quad \dots\dots\dots [1]$$

- (b) Jamila also throws a coin 120 times.
The relative frequency that she gets a head is 0.575

Work out how many **more** heads Jamila gets than Chen gets.

$$\begin{array}{l} \frac{x}{120} = 0.575 \\ x = 0.575 \times 120 \\ = 69 \end{array} \quad \begin{array}{l} | \\ | \\ | \\ | \\ | \end{array} \quad \begin{array}{l} 69 - 54 = 15 \end{array}$$

$$\quad \quad \quad 15 \quad \dots\dots\dots [2]$$

11. No.18

A supermarket puts coloured labels on bottles of drinks to show how much sugar each contains per 100 mL.

Each label is either green or yellow or red.

Colour of label	Amount of sugar per 100 mL of drink
Green	Less than 2.4 g
Yellow	Between 2.4 g and 6.2 g ✓
Red	More than 6.2 g

The supermarket sells lemonade in bottles containing 250 mL.
Each bottle contains 14.5 g of sugar.

Work out which colour label should be put on these bottles of lemonade.
Draw a ring around your answer.

Green

Yellow

Red

Show how you worked out your answer.

$$14.5 \text{ g} \text{ — } 250 \text{ mL}$$

$$? \text{ — } 100 \text{ mL}$$

$$\frac{14.5 \times 100}{250} = 5.8 \text{ g of sugar}$$

Colour label = Yellow

[2]

12. No.10

Mike has six cards each labelled with a letter.



He selects a card at random and records the letter on it.

(a) Write down a list of all the possible outcomes.

C will still be C.

C H A N E

[1]

(b) Write down the probability that Mike selects a card that is labelled with the letter C.

Total cards = 6
Number of C's = 2.

∴ Probability of C = $\frac{2}{6}$
or $\frac{1}{3}$.

$\frac{2}{6}$

[1]

13. No.29

Hassan travels by bus to work every morning.

The bus is either green or blue or yellow.

The table shows information about the probabilities of each colour.

Colour of bus	Green	Blue	Yellow
Probability	$2x$	$2x$	x

(a) Calculate the value of x .

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

$$2x + 2x + x = 1$$

$$\frac{5x}{5} = \frac{1}{5}$$

$$x = \frac{1}{5} = 0.2$$

$$x = \underline{\hspace{2cm} 0.2 \hspace{2cm}} [2]$$

(b) Work out the probability that Hassan's bus is either blue or yellow.

$$\text{Blue} = 2x = 2 \times 0.2$$

$$= 0.4$$

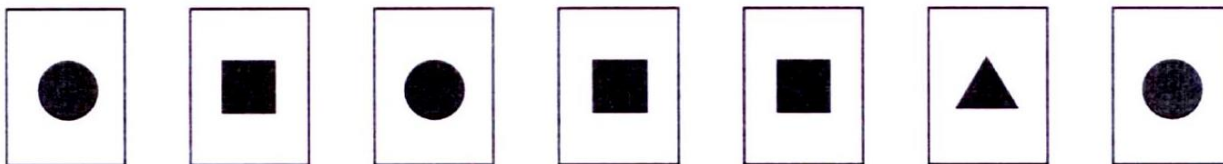
$$\text{Yellow} = 0.2$$

$$0.4 + 0.2 = 0.6$$

$$\underline{\hspace{2cm} 0.6 \hspace{2cm}} [1]$$

14. No.6

Lily has seven cards.



(a) She picks a card at random.

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

$\text{Cards} = 7$ $\text{Probability} = \frac{3}{7}$
 $\text{circles} = 3$ of circle

$\frac{3}{7}$

..... [1]

(b) Lily is given one more card.

The probability of picking at random a card with a square on it is now $\frac{1}{2}$

Draw a ring around the shape that must be on the new card.

square

circle

triangle

cannot tell

Total cards = 8
 If given a square
 then 4 squares
 $P = \frac{4}{8} = \frac{1}{2}$

[1]

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