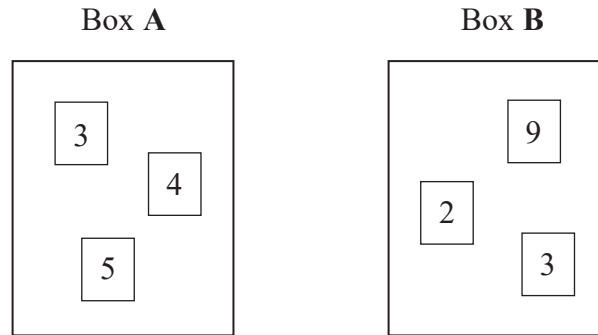


1. There are 3 cards in Box A and 3 cards in Box B.
There is a number on each card.



Ryan takes at random a card from Box A and a card from Box B.
He adds together the numbers on the two cards to get a total score.

Work out the probability that the total score is an odd number.

		A		
		3	4	5
B	2	5	6	7
	3	6	7	8
	9	12	13	14

$$\frac{4}{9}$$

$$\frac{4}{9}$$

(Total for Question is 2 marks)

2. There are only blue cubes, yellow cubes and green cubes in a bag.

There are

twice as many blue cubes as yellow cubes
and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

$$\begin{array}{l} B:Y \\ 2:1 \end{array}$$

$$\begin{array}{l} G:B \\ 4:1 \\ (\times 2) (\times 2) \\ 8:2 \end{array}$$

$$\begin{array}{l} G:B:Y \\ 8:2:1 \end{array}$$

$$\begin{array}{l} \text{Green} = 8 \\ \text{Blue} = 2 \\ \text{Yellow} = 1 \\ \text{Total} = 11 \end{array}$$

$$\frac{1}{11}$$

(Total for Question is 3 marks)

3. When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom
point down	31	53	16
point up	14	27	9
N° of throws	45	80	25

Rachael is going to drop the drawing pin once.

- (a) Whose results will give the **best estimate** for the probability that the drawing pin will land point up?
Give a reason for your answer.

Mel, because she threw the pin the most times ✓

(1)

Stuart is going to drop the drawing pin twice.

- (b) Use **all the results** in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

$$P(\text{Up}) = \frac{(14 + 27 + 9)}{(45 + 80 + 25)}$$

$$= \frac{50}{150}$$

$$\text{Probability} = \frac{\text{n° of throws point up}}{\text{total n° of throws}}$$

$$\frac{50}{150} \times \frac{100}{150} = \frac{2}{9}$$

$$P(\text{Down}) = \frac{(31 + 53 + 16)}{150}$$

$$= \frac{100}{150} \quad \checkmark$$

$$\frac{2}{9} \quad \checkmark$$

(2)

(Total for Question 3 is 3 marks)

4. A scout group has a raffle to raise money for charity.
There is 1 prize to be won in the raffle.

Laura buys 12 raffle tickets.

A total of 350 raffle tickets are sold.

Laura has 12 out of a
possible 350 tickets

Find the probability that Laura does not win the prize.

$P(\text{win}) + P(\text{doesn't win}) = 1$ ← as these are the only 2 possible outcomes

$$P(\text{doesn't win}) = 1 - P(\text{win})$$

$$= 1 - \frac{12}{350} \quad (1)$$

$$= \frac{338}{350}$$

$$\frac{338}{350} \quad (1)$$

(Total for Question is 2 marks)

5. There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

Colour	red	white	blue	yellow
Probability	$2x$	x	0.45	0.25

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

- (a) Work out the number of red counters in the bag.

Probabilities sum to 1 :

$$2x + x + 0.45 + 0.25 = 1$$

$$3x = 0.3 \quad (1)$$

$$x = 0.1$$

$$2x = P(\text{Red}) = 0.2 \quad (1)$$

$P(\text{Blue}) = 0.45$

$0.45t = 18$ ← total counters

$t = \frac{18}{0.45} = 40$ ← number of blue counters

counters (1)

Number of red counters :

$$40 \times 0.2 = 8$$

$$\frac{8}{(4)}$$

A marble is going to be taken at random from a box of marbles.

The probability that the marble will be silver is 0.5 $\frac{1}{2}t$ must be a whole number

There must be an even number of marbles in the box.

- (b) Explain why.

0.5 multiplied by an odd number will never be a whole number and we can not have half a marble. For half of a number to be an integer, the number must be even. (1)

(Total for Question is 5 marks)

6. In a bag there are only red counters, blue counters, green counters and yellow counters. A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	red	blue	green	yellow
Probability	0.4	0.15	0.2	0.25

= 1

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

probability of blue or green

$$1 - (0.4 + 0.25)$$

$$= 1 - 0.65$$

$$= 0.35$$

probability of blue

$$\frac{3}{7} \times 0.35 = 0.15$$

probability of green

$$= 1 - (0.4 + 0.15 + 0.25)$$

$$= 1 - 0.8$$

$$= 0.2$$

(Total for Question is 4 marks)

7. There are only 5 blue cards, 2 green cards and 4 red cards in a pack.

Isabella is going to take at random one card from the pack.

- (a) Write down the probability that Isabella will take a blue card.

$$\text{total number of cards} = 5 + 2 + 4 = 11$$

5 blue cards.

$$\therefore P(\text{blue}) = \frac{5}{11}$$

①

$$\frac{5}{11}$$

(2)

Ken is going to throw a biased dice once.

The probability that the dice will land on six is 0.3

- (b) What is the probability that the dice will not land on six?

$$P(6) = 0.3$$

$$P(\text{not } 6) = 1 - 0.3 = 0.7$$

①

Because sum of probabilities is always 1.

$$0.7$$

(1)

(Total for Question is 3 marks)

8. Malik is going to throw a fair coin 50 times.

(a) Write down an estimate for the number of times the coin will land on heads.

$$P(H) = \frac{1}{2}$$

$$\frac{1}{2} \times 50 = 25$$

①

25

(1)

Paula and Simon are trying to find out if a different coin is biased.

Paula throws this coin 10 times.

She records the number of times the coin lands on heads.

Simon throws the same coin 100 times.

He records the number of times the coin lands on heads.

(b) Whose results will be more useful in deciding if the coin is biased?

Give a reason for your answer.

Simon, because 100 is more than 10. ①

(1)

(Total for Question is 2 marks)