

1 In a bag, there are only red counters, blue counters, green counters and yellow counters.

The total number of counters in the bag is 80

In the bag

the number of red counters is $x + 7$

the number of blue counters is $x - 11$

the number of green counters is $3x$

Jude takes at random a counter from the bag.

The probability that he takes a red counter is $\frac{1}{4}$

Work out the probability that Jude takes a yellow counter.

$$\text{red} = \frac{x+7}{80} = \frac{1}{4} \quad (1)$$

$$\begin{aligned} x &= 20 - 7 \\ &= 13 \quad (1) \end{aligned}$$

$$\begin{aligned} \text{yellow} &= 80 - (13+7) - (13-11) - (3 \times 13) \\ &= 80 - 20 - 2 - 39 \quad (1) \\ &= 19 \end{aligned}$$

$$\frac{19}{80} \quad (1)$$

(Total for Question 1 is 4 marks)

2 Moeen has a biased 6-sided dice.

The table gives information about the probability that, when the dice is thrown, it will land on each number.

Number	1	2	3	4	5	6
Probability	x	0.15	0.5	y	0.13	0.03

(a) Show that $x + y = 0.19$

$$x + y + 0.15 + 0.5 + 0.13 + 0.03 = 1 \quad (1)$$

$$x + y + 0.81 = 1$$

$$x + y = 1 - 0.81 = 0.19 \quad (1)$$

(2)

Given that $3x - y = 0.09$

and $x + y = 0.19$

(b) work out the value of x and the value of y
Show clear algebraic working.

$$x = 0.19 - y$$

$$3(0.19 - y) - y = 0.09 \quad (1)$$

$$0.57 - 3y - y = 0.09$$

$$-4y = -0.48$$

$$y = 0.12$$

$$x = 0.19 - 0.12 \quad (1)$$

$$= 0.07$$

$$0.07 \quad (1)$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(3)

(Total for Question 2 is 5 marks)

3 There are 90 members in a diving club.
The diving club has a beginners group, an intermediate group and an advanced group.
Every member of the diving club is only in one of these groups.

The table shows information about the number of members in each group.

Group	beginners	intermediate	advanced
Frequency	18	x	$2x$

Kasim chooses at random one of the members of the diving club.

(b) Find the probability that this member is in the intermediate group.

$$\text{intermediate} + \text{advanced} = 90 - 18 = 72 \quad (1)$$

$$3x = 72$$

$$x = 24 \quad (1)$$

$$\frac{24}{90} \quad (1)$$

(3)

(Total for Question 3 is 3 marks)