

Q1. On a School trip student have a choice of picking a snack for lunch the table below records the classes choices.

Snack	Apple	Orange	Bannana	Crisps	Oat Bar
Frequency	5	2	6	12	5
Probability	$\frac{1}{6}$	$\frac{1}{15}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{1}{6}$

(a) Fill in the probability row on the table

(b) Work out the probability of picking a student who has picket an oat bar or crisps.

$$a) \# \text{ Students} : 5 + 2 + 6 + 12 + 5 = 30$$

$$\text{Apple: } \frac{5}{30} = \frac{1}{6} \quad \text{orange: } \frac{2}{30} = \frac{1}{15} \quad \text{Bannana: } \frac{6}{30} = \frac{1}{5}$$

$$\text{crisps: } \frac{12}{30} = \frac{2}{5} \quad \text{Oat Bar: } \frac{5}{30} = \frac{1}{6}$$

$$b) P(\text{oat or crisp}) = P(\text{oat}) + P(\text{crisp})$$

$$= \frac{1}{6} + \frac{2}{5}$$

$$= \frac{5}{30} + \frac{12}{30}$$

$$= \frac{17}{30}$$

crisps.

Q2.

A con artist uses an unfair spinner with 5 outcomes. The probability of landing on x then y is 0.02.

Spinner	A	B	C	D	E
Probability	x	0.1	$x + 0.1$	0.4	y

(a) Calculate x and y

(b) What is the probability of landing on A three times in a row.

The sum of all of the probabilities must be 1:

$$\text{So } x + 0.1 + (x + 0.1) + 0.4 + y = 1$$

$$2x + y + 0.6 = 1$$

So $2x + y = 0.4$ and we are given

that $xy = 0.02$

$$\text{So } 2x + \frac{0.02}{x} = 0.4$$

$$2x^2 - 0.4x + 0.02 = 0$$

$$\text{Now, } x^2 - 0.2x + 0.01 = 0$$

$$(x - 0.1)^2 = 0$$

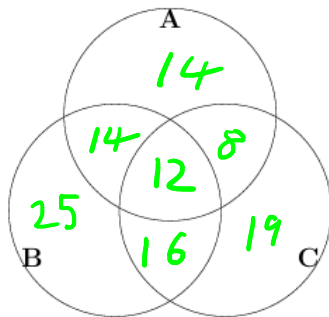
$$\text{So } x = 0.1.$$

b) The probability of landing on A three times is $x^3 = (0.1)^3 = 0.001$.

Q3.

150 students at school have to choose at least one sport from the the three options
 A :Table tennis, B :Running and C : Football.

A, B and C	A and B	A and C	B and C	A	B	C
12	26	20	28	48	59	55



(a) Fill in the Venn diagram

1

(b) What is the probability of a student doing Table tennis and running or Just football

(c) What is the probability that a student doing table tennis does all three sports.

$$b) \frac{26 + 19}{150} = 0.3$$

c) 48 students do table tennis 12 of them do every sport so

$$\frac{12}{48} = \frac{1}{4}$$

Challenge

1. A bag contains red and blue counters. The probability of picking two red counters without replacement is $\frac{1}{3}$. The number of blue counters is one more than the number of red counters. Calculate the number of red counters.

We start with r red and b blue counters
then the probability of picking red twice
in a row is

$$\frac{r}{r+b} \times \frac{r-1}{r-1+b} = \frac{1}{3} \quad \text{and } b = r+1 \quad \text{so}$$

$$\frac{r}{2r+1} \times \frac{r-1}{r} = \frac{1}{3} \quad \text{so}$$

$$3(r-1) = 2r+1$$

$$\text{so } r = 2 \quad \text{and } b = 3.$$