

3.  
 → all 723 members are entering into the draw for a single prize.

~~No~~ Maureen won the prize in one week. she will be participating into a draw again in next week for a single prize.

$$\text{Probability of Maureen winning in next week} = \frac{1}{723}$$

(there is only one prize & 723 members)

2)  
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	$x_i$	$f_i$	
	Result	Frequency	
$x_1$	Heads	12	$f_1$
$x_2$	Tails	15	$f_2$

Experimental probability of tossing a head

$$= \frac{x_1 f_1}{x_1 f_1 + x_2 f_2}$$

$$= \frac{12 \times 1}{(12 \times 1) + (15 \times 1)} = \frac{12}{27}$$

$$= \frac{12}{27}$$

4 → Probability of a factory manufacturing a defective steering pump = 0.015

$$0.015 = \frac{\text{no. of defective items}}{\text{total items}}$$

$$\text{total items} = 3000$$

$$\begin{aligned} \therefore \text{no. of defective items} &= 3000 \times 0.015 \\ &= 3 \times 15 = 45 \end{aligned}$$

$$\text{no. of defective items} = \underline{\underline{45}}$$

5

→ Percentage of bulbs which are defective in 40 is  $= \frac{3}{40} \times \frac{2.5}{100}$

$$= 7.5\%$$

7.5% bulbs are defective out of 40.

There are total 10,000 bulbs.

we will divide these 10,000 bulbs in a set of 40

$$= \frac{10,000}{40} = 250$$

So there will be 250 sets & in each set there are 3 defective bulbs.

$$\begin{aligned} \text{So total no. of defective bulbs} &= 250 \times 3 = \\ &= \underline{\underline{750}} \end{aligned}$$

7)  
→

There is a 20% chance of rain of Saturday

The rain is going to happen in a week  
The total probability of rain in a week is 100%.

There is 20% chance that ~~rain will~~ there  
~~be~~ will be rain on Saturday.  
So the probability will be  $\frac{20}{100}$

$$= 0.2$$

The statement (a) communicates the same forecast.

8)  
→

Factory assembly line

Each day 200 bottles were selected  
we are examining for 5 days

$$\text{therefor total no. of bottles} = 200 \times 5 \\ = 1000$$

Experimental probability =

$$= \frac{(5 \times 1) + (6 \times 1) + (9 \times 1) + (2 \times 1) + (4 \times 1)}{200 + 200 + 200 + 200 + 200}$$

$$= \frac{5 + 6 + 9 + 2 + 4}{1000} = \frac{26}{1000}$$

9)

Percent of Canadians with O- blood group is = 7%.

O- blood group donors are universal donors

We want to find no. of universal donors out of 200 people drive.

then total no. of universal donors out of 200 people =  $200 \times \frac{7}{100} = 14$

= 14 people are universal donors

10)

Dice is tossed.

sample space  $(S) = \{1, 2, 3, 4, 5, 6\}$

$n(S) = 6$

a)

→ event  $\Rightarrow$  landing on 1

$a = \{1\}$

$n(a) = 1$

$P(a) = \frac{n(a)}{n(S)} = \frac{1}{6}$

b)  $\Rightarrow$  3 or 4.

$$\text{event} = \underbrace{\{3\}}_{b_1} \text{ or } \underbrace{\{4\}}_{b_2}$$

or means we will add the probability

$$n(b_1) = 1, \quad n(b_2) = 1$$

$$P(b) = \frac{n(b_1)}{n(S)} + \frac{n(b_2)}{n(S)}$$

$$= \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$$

c) an odd number

$$\text{event } c = \{1, 3, 5\}$$

$$n(c) = 3$$

$$P(c) = \frac{n(c)}{n(S)} = \frac{3}{6} = \frac{1}{2} = 0.5$$

d) a number greater than 3

$$\text{event } d = \{4, 5, 6\} \quad n(d) = 3$$

$$P(d) = \frac{n(d)}{n(S)} = \frac{3}{6} = \frac{1}{2} = 0.5$$

e) an even number less than 5

$$e = \{2, 4\} \quad n(e) = 2$$

$$P(e) = \frac{n(e)}{n(S)} = \frac{2}{6} = \frac{1}{3}$$

f) multiple of 2

$$f = \{2, 4, 6\} \quad n(f) = 3$$

$$P(f) = \frac{n(f)}{n(S)} = \frac{3}{6} = 0.5$$

iii  
→

25 Red pieces, 22 blue pieces,  
28 white pieces  
total pieces =  $22 + 25 + 28 = 75$

here we will use combination formula  ${}^nC_r$

a) randomly chosen ball will be blue

$$P(a) = \frac{{}^{22}C_1}{{}^{75}C_1} = \frac{22}{75} = 0.2933...$$

b)

→ one piece is drawn & not replaced

∴ total no. of blue pieces =  $22 - 1 = 21$

total no. of balls =  $75 - 1 = 74$

$$P(b) = \frac{{}^{21}C_1}{{}^{74}C_1} = \frac{21}{74} = 0.2838...$$

c)

→ total no. of Red pieces = 25

first piece is removed but not replaced so

total no. of balls =  $75 - 1 = 74$

$$P(c) = \frac{{}^{25}C_1}{{}^{74}C_1} = \frac{25}{74} = 0.3378$$

→

d)  
→ two pieces are drawn & not replaced  
therefor total no of pieces remained in  
container =  $75 - 2 = 73$

total no. of white pieces = 28

$$P(d) = \frac{{}^{28}C_1}{{}^{73}C_1} = \frac{28}{73} = 0.3836$$