

3.9) $P(B)$ and $P(RH^+)$

$$\left(\frac{8}{100} \times \frac{1}{2} \right) = \frac{1}{25}$$

b) $P(ABRH^+)$ or $P(ABRH^-)$

$$\frac{4}{100} + \frac{1}{100} = \frac{5}{100} = \frac{1}{25}$$

c) $P(A)$ or $P(RH^+)$

$$\frac{35}{100} + \frac{1}{2} = \frac{35+50}{100} = \frac{85}{100} = \frac{17}{20}$$

d) $P(O)$ or $P(RH^+)$ or $P(ARL^+)$ or $P(ABRH^+)$

$$\left(\frac{6}{100} \times \frac{1}{2} \right) + \left(\frac{5}{100} \times \frac{1}{2} \right) + \left(\frac{1}{100} \times \frac{1}{2} \right)$$

$$\frac{3}{100} + \frac{1}{40} + \frac{1}{200} = \frac{6+5+1}{200} = \frac{12}{200} = \frac{3}{50}$$

$$e) \frac{1}{25} + \frac{1}{25} + \frac{17}{20} + \frac{3}{50} = \frac{4+4+85+6}{100} = \frac{99}{100} \approx 1$$

All the possible outcomes are met. Rhesus factor was first discovered from the blood of Rhesus monkeys.

f)

$P(OOORH^+)$

$$\frac{39}{100} \times \frac{39}{100} \times \frac{39}{100} = \frac{59319}{1000000} = 0.0593$$

g) $(PBBBRL^-)$

$$\frac{2}{100} \times \frac{2}{100} \times \frac{2}{100} = \frac{8}{1000000} = \frac{1}{125000} = 0.000008 \approx 0.0$$

$$h. P(OOORR^t)$$

$$\frac{39}{100} \times \frac{38}{99} \times \frac{37}{98} = \frac{54834}{970200} = 0.0565.$$

$$i) P(BBRR^t)$$

$$\frac{2}{100} \times \frac{1}{99} \times \frac{0}{98} = 0.$$

$$4. \left(\frac{63.7}{100} \right)^{27}$$

$$= 5.149 \times 10^{-6}$$

$$= 0.000005149$$

∴ I would not believe her since the probability is an impossibility.

$$5. \left(\frac{1}{6} \right)^4 = \frac{1}{1296}$$

6. There is a 70% chance that the adult American know the national statistics Day in India.
The probability is unlikely as it is a guess.

$$7. 1 - P(\text{LLLLLLLL})$$

$$1 - \left(\frac{89.3}{100} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} \right)$$

$$1 - 0.3068$$

$$= 0.6932$$

$$8. 6! \times 55 = 39600 \quad \text{probability} = \frac{1}{39600}$$

bookkeeper

$$9. a) n = 10 \quad b = 1, d = 2, k = 2, e = 3, p = 1, r = 1$$

$$\frac{n!}{r_1! r_2! \dots r_k!} = \frac{10!}{1! 2! 2! 3! 1! 1!} = \frac{3628800}{1 \times 2 \times 2 \times 6 \times 1 \times 1 \times 1}$$

$$= 151,200$$

b) Facetiously

$$n=11 \quad f=1, a=1, c=1, e=1, t=1, o=1, u=1, s=1, l=1, y=1$$

$$= \frac{n!}{n_1! n_2! \dots n_r!} = \frac{11!}{1! 1! \dots 1!}$$

$$= 11! = 39916800$$

This word is notable in that it has no sets of repeatable words or letters.

$${}^{10}C_7 = {}^{10}C_3 = 120 \approx 2.666$$

$$b) {}^nC_n = {}^{14}C_6 = 2.333 \approx 2.$$

$$c) \frac{n(\text{all subcommittee members})}{n(\text{total})}$$

$$= \frac{666}{3003} = \frac{1}{3003} = 0.000333$$

This is unlikely because the probability is approximately zero.

$$\left(\frac{1}{100} + \frac{1}{2} + \frac{1}{100} \right) + \left(\frac{1}{100} + \frac{1}{2} + \frac{1}{100} \right)$$

$$e) \frac{1}{25} + \frac{1}{25} + \frac{17}{20}$$

All the possible first discovered

$$f) P(000000) = \frac{39}{100} \times \frac{39}{100} \times \frac{39}{100}$$

$$g) P(888888)$$

$$\frac{2}{100} \times \frac{2}{100} \times \frac{2}{100}$$

11. a) $\bar{x}$ = probability $\times$ sample size

$$= 0.75 \times 11$$

$$\bar{x} = 8.25$$

Standard deviation = $\sqrt{\text{Sample size} \times p \times (1-p)}$

$$= \sqrt{11 \times 0.75 \times (1-0.75)}$$

$$= \sqrt{8.25 - 0.25}$$

$$= \sqrt{8}$$

$$= 2.828.$$

b) $P(X > 75) = 1 - P(X \leq 75)$

$$P(Z \leq 0.5) = 0.6915$$

$$P(X > 75) = 1 - P(X \leq 75) = 1 - P(Z \leq 0.5) = 1 - 0.6915 \\ = 0.3085$$

The outcome is not unusual as it is between 0 and 1

c) $P(X > 90) = 1 - P(X \leq 90)$

$$P(Z \leq 0.1) = 0.8895$$

$$P(X > 90) = 1 - P(X \leq 90) = 1 - P(Z \leq 0.1) = 1 - 0.8895 = 0.1105$$