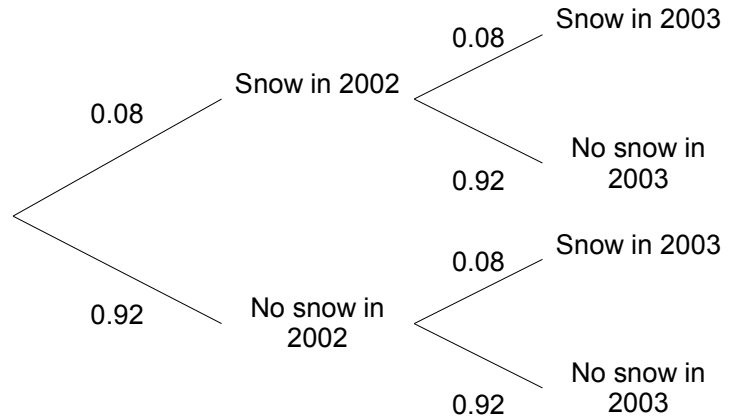


Solutions to Past Paper Questions – Probability

- 1) (a) $0.3 + 0.1 = 0.4$
 (b) $0.3 \times 0.3 = 0.09$

- 9) (a) $0.08 \times 0.08 = 0.0064$
 (b) $p[(\text{Snow in 2002, No snow in 2003}) \text{ OR } (\text{No Snow in 2002, Snow in 2003})]$
 $= (0.08 \times 0.92) + (0.92 \times 0.08)$
 $= 0.1472$

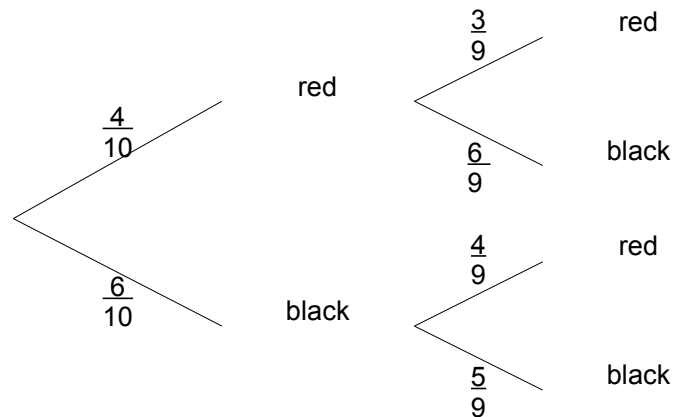


- 8) (a) See diagram

(b) $p(\text{Black, Black}) = \frac{6}{10} \times \frac{5}{9} = \frac{30}{90} = \frac{1}{3}$

(c) $p(\text{Red, Red}) = \frac{4}{10} \times \frac{3}{9} = \frac{12}{90}$

So $p(\text{two of same colour}) = \frac{12}{90} + \frac{30}{90} = \frac{42}{90}$



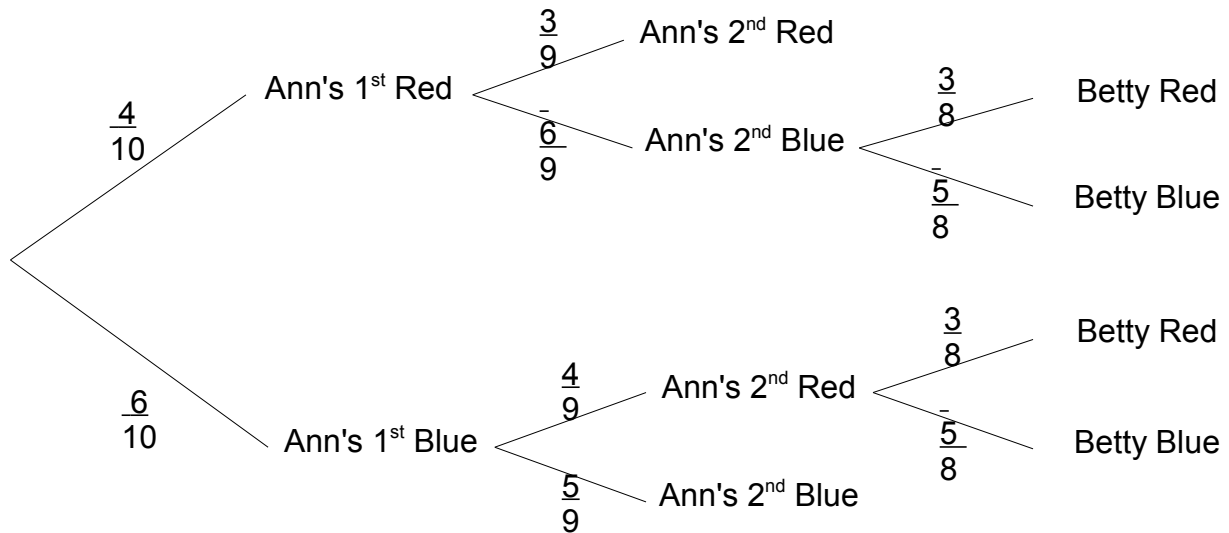
- 12) (a) Spanish 0.3; on second branches reading down 0.6, 0.4, 0.6, 0.4

- (b) (i) $0.7 \times 0.6 = 0.42$
 (ii) $(0.7 \times 0.6) + (0.3 \times 0.4) = 0.42 + 0.12 = 0.54$

- (c) $0.42 \times 200 = 84$ will choose French and Geography, so $200 - 84 = 116$ will not

- 11) (a) Fill in gaps: 0.05, 0.2 and 0.2
 (b) $0.95 \times 0.8 = 0.76$
 (c) $(0.95 \times 0.2) + (0.05 \times 0.8) = 0.23$

18)



(a) For Ann: $p(\text{(Red, Red) OR (Blue, Blue)}) = \left(\frac{4}{10} \times \frac{3}{9}\right) + \left(\frac{6}{10} \times \frac{5}{9}\right) = \frac{12}{90} + \frac{30}{90} = \frac{42}{90}$ or $\frac{7}{15}$

(b) $p(\text{match is a draw}) = \left(\frac{4}{10} \times \frac{6}{9} \times \frac{5}{8}\right) + \left(\frac{6}{10} \times \frac{4}{9} \times \frac{5}{8}\right) = \frac{120}{720} + \frac{120}{720} = \frac{240}{720}$ or $\frac{1}{3} =$

19) It is simpler to first work out $p(\text{they ARE the same})$ and then use the fact that $p(\text{not the same}) = 1 - p(\text{they are the same})$

$$p(\text{they are the same}) = \left(\frac{6}{15} \times \frac{4}{12}\right) + \left(\frac{4}{15} \times \frac{3}{12}\right) + \left(\frac{5}{15} \times \frac{5}{12}\right) = \frac{61}{180}$$

$$\text{So } p(\text{not the same}) = \frac{119}{180}$$

20) On the first draw there are n beads, $n-6$ of which are white.

On the second draw, there are $n-1$ beads, $(n-6)-1$ of which are white.

$$\text{So } p(\text{White bead on first draw AND white bead on second draw}) = \frac{n-6}{n} \times \frac{n-7}{n-1}$$

$$\text{So } \frac{n-6}{n} \times \frac{n-7}{n-1} = \frac{1}{2}$$

$$\frac{n^2 - 13n + 42}{n^2 - n} = \frac{1}{2}$$

$$n^2 - 13n + 42 = \frac{1}{2}(n^2 - n)$$

$$2(n^2 - 13n + 42) = n^2 - n$$

$$2n^2 - 26n + 84 = n^2 - n$$

$$n^2 - 25n + 84 = 0$$