

## Class Exercise 13

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**Q1.** In a group of 100 sports car buyers, 40 bought alarm systems, 30 purchased bucket seats, and 20 purchased an alarm system and bucket seats. If a car buyer chosen at random bought an alarm system, what is the probability they also bought bucket seats?

$$P(A) = \frac{40 \text{ (alarm system)}}{20 \text{ (alarm system + bucket)}}$$
$$= 50\%$$

**Q2.** A tube of sweets contains 10 red sweets, 7 blue sweets, 8 green sweets and 5 orange sweets. If a sweet is taken at random from the tube, what is the probability that it is:

- (a) red,
- (b) orange,
- (c) green or red,
- (d) not blue ?

$$(a) P(R) = \frac{10}{30} = 33\%$$

$$(b) P(O) = \frac{5}{30} = 16.6\%$$

$$\begin{aligned} (c) P(R \cup G) &= P(R) + P(G) \\ &= P(R) \\ &= P(R \cup G) = \frac{18}{30} \\ &= 60\% \end{aligned}$$

$$(d) P(B) = \frac{7}{30}$$

$$= 23\% \text{ so,}$$

$$= 76\%$$

$$\frac{23}{30}$$

$$= 76\% \text{ not be blue.}$$

**Q3.** Nine balls, each marked with a number from 1 to 9, are placed in a bag and one ball is taken out at random. What is the probability that the number on the ball is :

(a) odd, 1, 3, 5, 7, 9 (5 odd numbers)

(b) a multiple of 3, 3, 6, 9 (3 numbers)

(c) a 5, 1 number

(d) not a 7? 1 number

$$(a) P(9) = \frac{5}{9} = 55\%$$

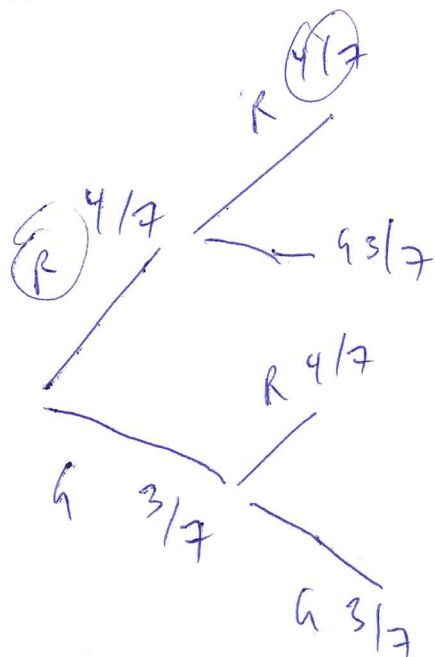
$$(b) P(3) = \frac{3}{9} = 33\%$$

$$(c) P(1) = \frac{1}{9} = 11\%$$

$$(d) P(1) = \frac{8}{9} = 88\%$$

**Q4.** A bag contains 4 red balls and 3 green balls. A ball is taken out at random, and then put back; a second ball is then taken from the bag. By drawing a probability tree, determine the probability that:

- (a) both balls are the same colour,
- (b) at least one of the balls is green,
- (c) the balls are of different colours?



$$P(RR) = \frac{4}{7} \times \frac{4}{7} = \frac{16}{49}$$

$$P(RG) = \frac{4}{7} \times \frac{3}{7} = \frac{12}{49}$$

$$P(GR) = \frac{3}{7} \times \frac{4}{7} = \frac{12}{49}$$

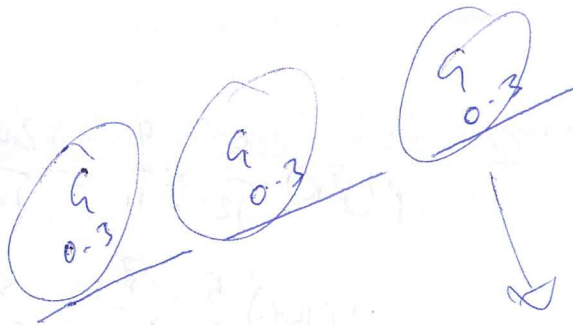
$$P(GG) = \frac{3}{7} \times \frac{3}{7} = \frac{9}{49}$$

$$(a) P(RR) + P(GG) = \frac{16}{49} + \frac{9}{49} = \frac{25}{49}$$

$$(b) P(RG) + P(GR) + P(GG) = \frac{12}{49} + \frac{12}{49} + \frac{9}{49} = \frac{33}{49}$$

$$(c) P(RG) + P(GR) = \frac{12}{49} + \frac{12}{49} = \frac{24}{49}$$

**Q5.** On her way to work, Sylvia drives through three sets of traffic lights. The probability of each set of lights being green is 0.3. What is the probability that they are all green?

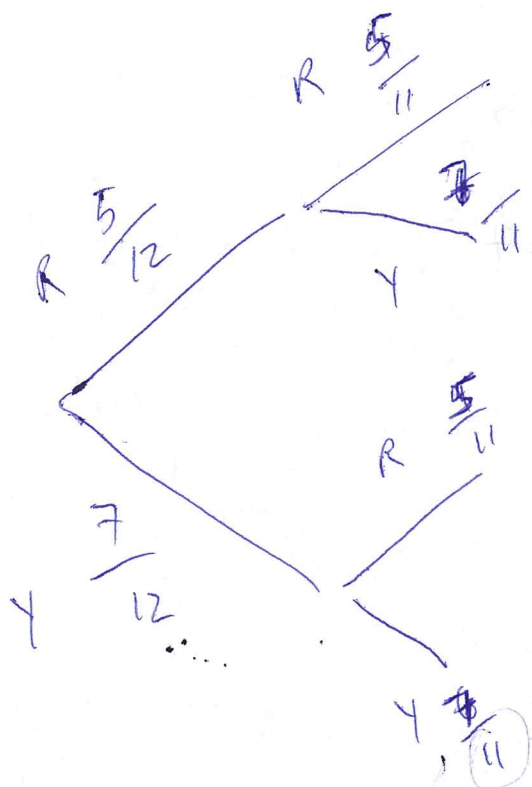


$$\begin{aligned}P(GGG) &= 0.3 \times 0.3 \times 0.3 \\&= \cancel{0.27} 0.027 \\&= 2.7\%\end{aligned}$$

**Q6.** A bag contains 7 yellow balls and 5 red balls. One ball is taken from the bag at random, and is not replaced. A second ball is then taken from the bag.

By drawing a probability tree, determine the probability that:

- (a) both balls are red,
- (b) both balls are the same colour,
- (c) the balls are different colours,
- (d) at least one ball is yellow.



$$P(RR) = \frac{5}{12} \times \frac{4}{11} = \frac{20}{132}$$

$$P(RY) = \frac{5}{12} \times \frac{7}{11} = \frac{35}{132}$$

$$P(YR) = \frac{7}{12} \times \frac{5}{11} = \frac{35}{132}$$

$$P(YY) = \frac{7}{12} \times \frac{6}{11} = \frac{42}{132}$$

$$(a) \quad \frac{20}{132} = 15\%$$

$$(b) \quad P(RR) + P(YY) = \frac{20}{132} + \frac{42}{132} = \frac{62}{132} = 46\%$$

$$(c) \quad P(RY) + P(YR) = \frac{35}{132} + \frac{35}{132} = \frac{70}{132} = 53\%$$

$$(d) \quad P(RY) + P(YR) + P(YY) = \frac{35}{132} + \frac{35}{132} + \frac{42}{132} = \frac{112}{132} = 84\%$$