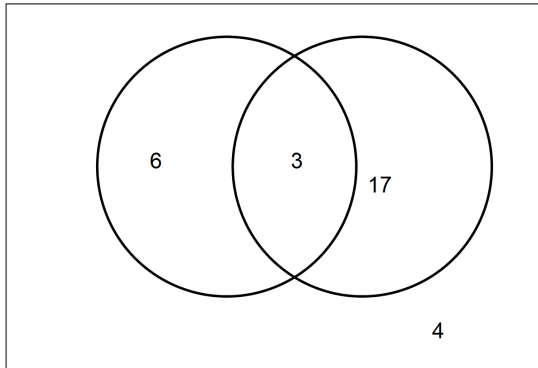


**PART II - Answer Key**

36(a). Brandon surveyed his classmates to see if they liked Action movies or Horror movies.

- 9 people like Horror movies
- 3 people like both Action movies and Horror movies
- 4 people like neither type of movie
- 20 people like Action movies

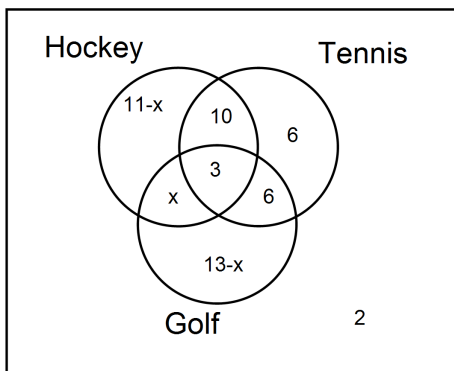
Draw a Venn diagram to determine how many people were surveyed in total.



$9 - 3 = 6$  (Horror only)  
 $20 - 3 = 17$  (Action only)  
 30 people in total

3 36(b). 50 members of a sports club were surveyed:

Determine the number of people who play hockey **AND** golf but **NOT** tennis.



$$\begin{aligned}
 11-x+10+3+6+6+x+13-x+2 &= 50 \\
 -x + 51 &= 50 \\
 -x &= -1 \\
 x &= 1
 \end{aligned}$$

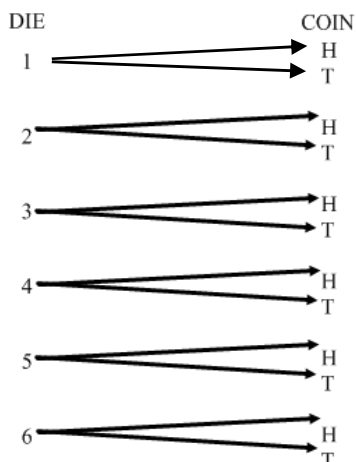
**1 person**

2 37(a). How many different arrangements of the letters MATHEMATICS are there?

$$\frac{11!}{2!2!2!} = \frac{39916800}{2 \times 2 \times 2} = \frac{39916800}{8} = 4\,989\,600$$

2 37(b). David rolls a fair die and flips a fair coin. Use a graphic organizer such as a tree diagram or table to illustrate all possible outcomes.

Students may set up something like the following or have another suitable graphic.



- 3 37(c). How many 6 person committees can be formed from a group of 4 teachers and 30 students if there must be at least 3 teachers?

$$\begin{aligned} &({}_4C_3 \times {}_{30}C_3) + ({}_4C_4 + {}_{30}C_2) \\ &16240 + 435 \\ &16675 \end{aligned}$$

- 3 37(d). Algebraically solve for  $n$ :  ${}_nP_2 = 72$

$${}_nP_2 = 72$$

$$\frac{n!}{(n-2)!} = 72$$

$$\frac{n(n-1)(n-2)!}{(n-2)!} = 72$$

$$n(n-1) = 72$$

$$n^2 - n - 72 = 0$$

$$(n-9)(n+8) = 0$$

$$n = 9, n = -8 \text{ (reject)}$$

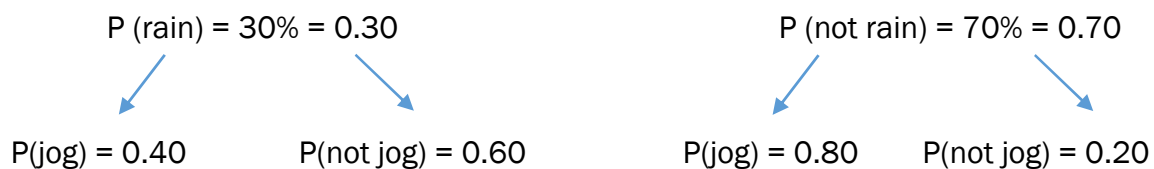
- 3 38(a). When considering the total arrangements of the letters of the word FLOAT, what is the probability of the vowels (O, A) being together?

$$\# \text{ of Possible Arrangements with conditions} = 4! 2! = 48$$

$$\text{Total Possibilities without conditions} = 5! = 120$$

$$\text{Probability} = \frac{48}{120} = \frac{2}{5}$$

- 3 38(b). John likes to jog. If the weather is nice he is 80% likely to jog. If it is raining he is only 40% likely to jog. The forecast for tomorrow indicates a 30% chance of rain. What is the probability that he will jog tomorrow?



$$P(\text{jog}) = (\text{Probability of Raining AND Probability of Jogging}) \text{ OR } (\text{Probability of Not Raining AND Jogging})$$

$$P(\text{jog}) = (0.30 \times 0.40) + (0.70 \times 0.80) = 0.12 + 0.56 = 0.68$$

- 3 38(c). A recent survey indicated that 98% of all high school students in Newfoundland have a cell phone and of these students, 40% have an I-Phone. What is the probability of a student owning a cell phone that is not an I-Phone?

I = owns an I-Phone  
C = owns a cell phone

$$P(I|C) = 0.4$$

$$P(I'|C) = 0.6$$

$$P(C \cap I') = P(C) \times P(I'|C) = 0.98 \times 0.6 = 0.588$$

- 3 39(a). Solve:  $\frac{2}{3x} + \frac{5}{6} = 2$

$$\frac{4}{6x} + \frac{5x}{6x} = \frac{12x}{6x}$$

$$4 + 5x = 12x$$

$$4 = 7x$$

$$x = \frac{4}{7}$$

- 4 39(b). Simplify and state the restrictions:  $\frac{6x+30}{6+3x} \div \frac{3(x+5)}{x^2-4}$

$$\frac{6x+30}{6+3x} \cdot \frac{x^2-4}{3(x+5)}$$

$$\frac{6(x+5)}{3(2+x)} \cdot \frac{(x+2)(x-2)}{3(x+5)}$$

$$\frac{2(x-2)}{3}$$

$$x \neq -5, -2, 2$$

- 39(c). It takes Jason and Sean 6 minutes to shovel their driveway when they work together. When Jason works alone, he takes 5 minutes more to shovel the driveway than when he works alone.
- 1 (i) Set up a rational equation to model the situation.

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

2

- (ii) Use your equation from (i) to determine how long it would take Sean to shovel the driveway when he works alone.

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

$$\frac{6}{t} \cdot \left(\frac{t+5}{t+5}\right) + \frac{6}{t+5} \cdot \left(\frac{t}{t}\right) = 1$$

$$\frac{6t+30}{t^2+5t} + \frac{6t}{t^2+5t} = 1$$

$$\frac{6t+30+6t}{t^2+5t} = 1$$

$$12t + 30 = t^2 + 5t$$

$$t^2 - 7t - 30 = 0$$

$$(t - 10)(t + 3) = 0$$

$$t = 10 \text{ or } t = -3$$

t must be positive so Sean takes 10 minutes.