

Revision of Grade 12 Probability Part 1

Key Concepts

- Likelihood or chance of something happening
- Measured on a scale from 0 to 1
- Event - Collection of one or more outcomes of an experiment
- Probability scale
- $P(E) = \frac{\text{Number of ways of E happening}}{\text{Total number of possible outcomes}}$

X-ample 1

A fair die is thrown. What is the probability of:

- a) Getting a six
- b) Not getting a six
- c) Getting 4 or more

X-ample 2

A factory checks 90 soccer balls and finds that 30 have a fault. If a ball is chosen at random what is the probability that it:

- a) Has a fault
- b) Does not have a fault

X-ample 3

In a school with 20 educators, 8 own cars and 5 wear glasses, 4 of the teachers who own cars also wear glasses. Calculate the probability that, if you picked a teacher at random, the teacher would:

- a) Own a car
- b) Not wear glasses and own a car.

	WEAR GLASSES	NO GLASSES	TOTAL
OWN CARS			
NO CARS			
TOTAL			

Concept: Venn Diagrams

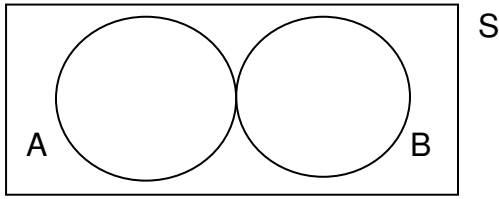
- Sample space-set of all possible events
- Venn diagram shows a sample space and its events

Mutually Exclusive events

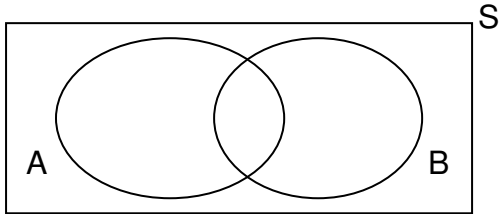
Suppose there are 2 events A & B

$$A = \{1, 2, 3\} \quad B = \{4, 5, 6\}$$

We can represent this on a Venn diagram as follows:



Union and Intersection of sets

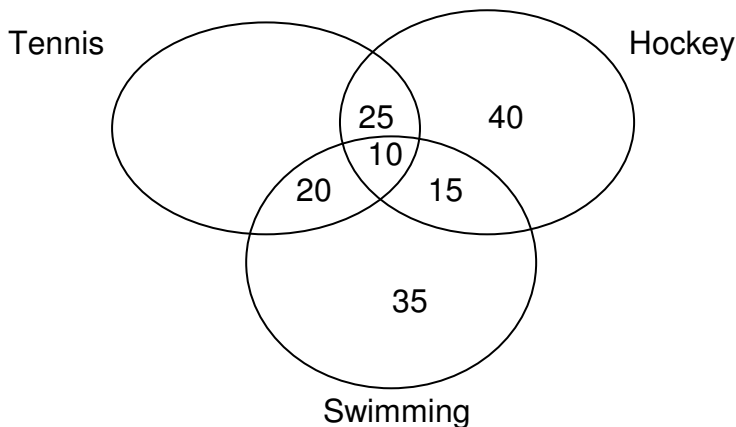


$A = \{ \quad \quad \quad \}$
 $B = \{ \quad \quad \quad \}$
 $A \cup B = \{ \quad \quad \quad \}$
 $A \cap B = \{ \quad \quad \quad \}$

X-ample 4

An all girl school held a sports clinic during the holidays. The sports offered were tennis, hockey and swimming. Girls could participate in as many of the sports as they liked. The diagram illustrates the participation. Each circle represents a sport. How many girls participated in:

- a) All 3 sports
- b) Only hockey
- c) Tennis and swimming
- d) Swimming
- e) If 175 girls attended the sports clinic, how many played only tennis?



X-ample 5

There are 6 chocolate flavoured, 4 strawberry flavoured and 5 vanilla flavoured ice creams in a box. What is the probability that an ice cream chosen at random is:

- a) Chocolate flavoured
- c) Not chocolate flavoured

X-ample 6

- a) What is the probability of rolling a die and getting an even number less than 6?
- b) What is the probability of not getting an even number less than 6?

X-ercise

- 1) Eleven cards are cut out , each one has a letter of the word MATHEMATICS as shown below:

M	A	T	H	E	M	A	T	I	C	S
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If a card is chosen at random, calculate each of the following probabilities.

- a) $P(A)$
 - b) $P(\text{not } A)$
 - c) $P(\text{Vowel})$
 - d) $P(\text{Consonant})$
 - e) $P(M \text{ or } T)$
 - f) $P(\text{vowel or consonant})$
 - g) $P(C \text{ or a vowel})$
- 2) In a class of 25 learners, there are 15 girls. 7 learners wear glasses. 3 female learners wear glasses. Calculate the probability that if you pick a learner at random, the learner will be:
- a) Male
 - b) Male and not wear glasses
- 3) All the members of the debating club at Mount Frere High are in Grades 10, 11 or 12. (Taken from: DoE November 2009) (7 Marks)

The number of learners belonging to the debating club is given in the table below:

	Grade 10	Grade11	Grade12	Total
Girls	33	77	0	110
Boys	132	0	60	192
Total	165	77	60	302

Determine the probability of randomly choosing a member of the debating club who is:

3.1.1) A boy in Grade 12

3.1.2) A learner who is not in Grade 10

Answers

1. a) $\frac{2}{11}$

b) $\frac{9}{11}$

c) $\frac{4}{11}$

d) $\frac{7}{11}$

e) $\frac{4}{11}$

f) $1 \left(\frac{11}{11}\right)$

g) $\frac{5}{11}$

2. a) $P(\text{male}) = \frac{10}{25} = \frac{2}{5}$

b) $P(\text{male and no glasses}) = \frac{10 - 4}{25} = \frac{6}{25}$

3.1.1 $P = \frac{60}{302}$

3.1.2 $P = \frac{302 - 165}{302} = \frac{137}{302}$