



Western Cape  
Government

Western Cape Education Department  
**Directorate: Curriculum FET**

---

# Mathematics

REVISION BOOKLET  
2024 TERM 3

Grade 10

This revision program is designed to assist you in revising the critical content and skills that you have covered during the 3<sup>rd</sup> and 4<sup>th</sup> term. The purpose is to prepare you to understand the key concepts and to provide you with an opportunity to establish the required standard and the application of the knowledge necessary to succeed in the examination.

The revision program covers the following topics:

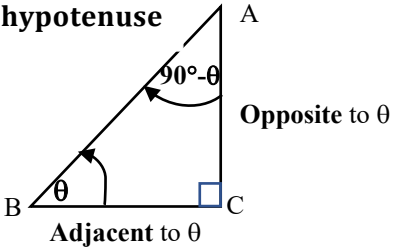
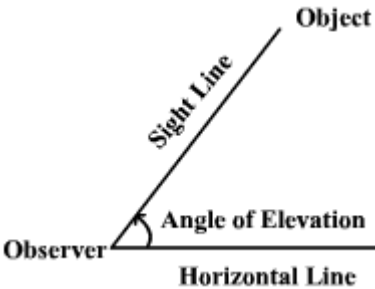
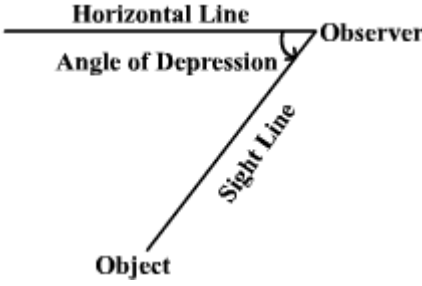
- A. TRIGONOMETRY **Pg 3**  
2D APPLICATION
  
- B. STATISTICS **Pg 7**
  
- C. PROBABILITY **Pg 14**
  
- D. FINANCIAL MATHEMATICS **Pg 19**

# TRIGONOMETRY 2D APPLICATION

Trigonometry was developed in ancient civilisations to solve practical problems such as building construction and navigation. When given a right angled triangle with two sides the 3<sup>rd</sup> side can be determined using the theorem of Pythagoras. Sometimes we however need one of the other angles and sometimes the angles of the right angled triangle is given and one side and we need to determine the other two sides of the right-angled triangle.

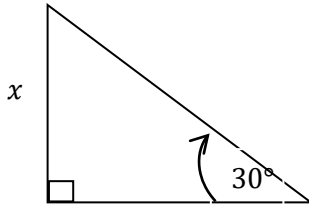
Trigonometry enables us to determine,

- a) a side in a right-angled triangle if an angle and one side is given
- b) an angle when two sides of the triangle is given

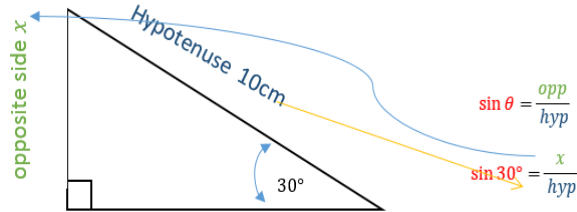
Naming sides in a right-angled triangle:	Defining the trig ratios in a right-angled triangle:
<p>For any right-angled <math>\Delta</math>, we identify the sides in the following order:</p> <ol style="list-style-type: none"> <li>1. The longest side is called the <b>hypotenuse</b>. The angle <math>\angle</math> across the hypotenuse is indicated by a small block <math>\square</math>. This block represents a right angle i.e. <math>90^\circ</math>.</li> <li>2. The side across from the angle you are working with is the <b>opposite side</b>,</li> <li>3. and the remaining side is called the <b>adjacent side</b></li> </ol> 	<p><b>SUMMARY:</b></p> $\sin \theta = \frac{o}{h} \quad , \quad \cos \theta = \frac{a}{h} \quad , \quad \tan \theta = \frac{o}{a}$ <p style="text-align: center;"><b>Soh Cah Toa</b></p> <p style="text-align: center;"><b>OR</b></p> <p style="text-align: center;"><b>sinoh cosah tanoa</b></p> <p>(make your OWN rhyme to remember the ratios as they are <b>VERY IMPORTANT</b>)</p>
<p><b>ANGLE OF ELEVATION</b> The term <b>angle of elevation</b> represents the angle from the horizontal line upward to an object. An observer's line of sight would be above the horizontal line.</p> 	<p><b>ANGLE OF DEPRESSION</b> The term <b>angle of depression</b> represents the angle from the horizontal line downward to an object. An observer's line of sight would be below the horizontal line.</p> 

## Examples

1. Determine the length of the side  $x$ , in the sketch below.



**Solutions:**



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 30^\circ = \frac{x}{10}$$

$$\frac{10}{1} \times \sin 30^\circ = \frac{x}{10} \times \frac{10}{1}$$

$$10 \times \sin 30^\circ = 1x$$

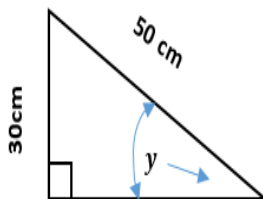
$$1x = 10 \times \sin 30^\circ$$

$$1x = 10 \times \frac{1}{2}$$

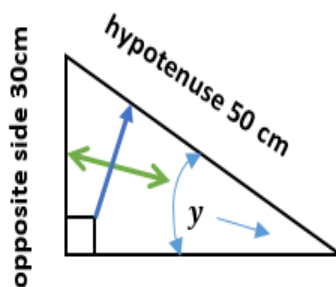
$$1x = 5 \text{ cm}$$

1. **Identify  $x$** , is the side opposite the given angle  $30^\circ$ .
2. **Pick the correct ratio.** The opposite must be calculated, and the length of the hypotenuse is given. The trig ratio involving opposite side and hypotenuse is the **sine ratio**. **Substitute** the values/variables that we know
3. **Rearrange** the formula to

2. Determine the size of the angle  $y$ .



**Solution:**



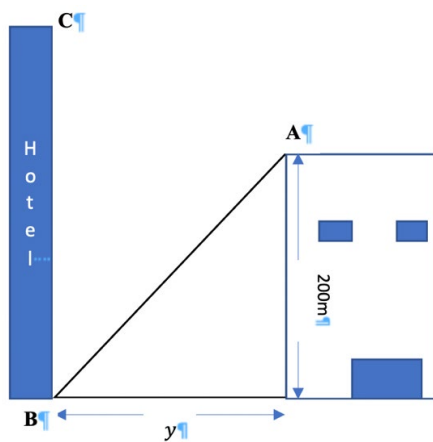
The lengths of the hypotenuse and opposite side are given. The trig ratio involving these two sides is the sine ratio.

$$\sin y = \frac{30}{50}$$

$$y = \sin^{-1}\left(\frac{30}{50}\right)$$

$$y = 36,87^\circ$$

3. The angle of depression is from point A on the top of a building 200m high to the base of a Hotel, B. Determine the distance on the



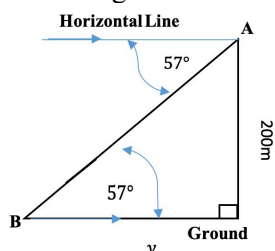
ground between the building and the hotel.

**Solution:**

**Steps:**

Draw the sketch as below indicating the  $90^\circ$  angle which the building makes with the ground.

1. Mark the angle of depression, which is the angle the sight line (AB) makes with the horizontal. Note that the horizontal line is parallel to the ground. Thus because of alternate angles being equal the angle B inside the triangle can be marked as



$$\text{Solution: } \tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan 57^\circ = \frac{200}{y}$$

$$\frac{y}{1} \times \tan 57^\circ = \frac{y}{1} \times \frac{200}{y}$$

$$y \times \tan 57^\circ = 200$$

$$\frac{y \times \tan 57^\circ}{\tan 57^\circ} = \frac{200}{\tan 57^\circ}$$

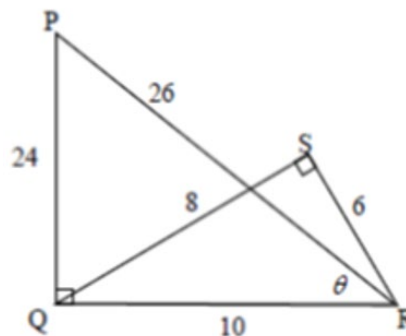
$$y = \frac{200}{\tan 57^\circ}$$

$$y = 412,63 \text{ m}$$

### QUESTION 1

$\Delta PQR$  and  $\Delta SQR$  are right-angled triangles as shown in the diagram below.

$PR = 26$ ,  $PQ = 24$ ,  $QS = 8$ ,  $SR = 6$ ,  $QR = 10$  and  $\hat{P}RQ = \theta$ .



Refer to the diagram and, WITHOUT using a calculator, write down the value of:

1.1  $\tan \hat{P}$  (1)

1.2  $\sin \hat{S}QR$  (1)

1.3  $\cos \theta$  (1)

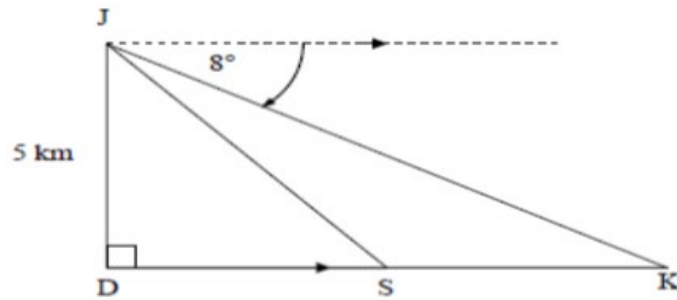
### QUESTION 2

2.1 Solve for  $x$ , correct to two decimal places, in each of the following equations where  $0^\circ \leq x \leq 90^\circ$ .

2.1.1  $5 \cos x = 3$  (2)

2.1.2  $\tan 2x = 1,19$  (3)

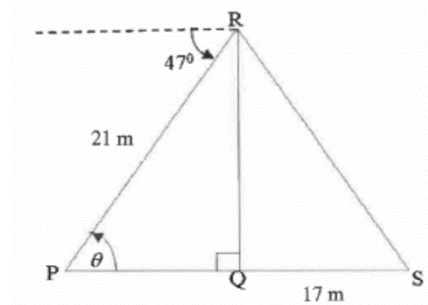
- 2.2 An aeroplane at J is flying directly over a point D on the ground at a height of 5 kilometres. It is heading to land at point K. The angle of depression from J to K is  $8^\circ$ . S is a point along the route from D to K.



- 2.2.1 Write down the size of  $\hat{JKD}$ . (1)  
 2.2.2 Calculate the distance DK, correct to the nearest metre. (3)  
 2.2.3 If the distance SK is 8 kilometres, calculate the distance DS. (1)  
 2.2.4 Calculate the angle of elevation from the point S to J, correct to ONE decimal place. (2)

### QUESTION 3

RQ is a vertical pole. The foot of the pole, Q, is on the same horizontal plane as P and S. The pole is anchored with cables RS and RP. The angle of depression from the top of the pole to the point P is  $47^\circ$ . PR is 21m and QS is 17m.  $\hat{P}RQ = \theta$ .



- 3.1 Write down the size of  $\theta$ . (1)  
 3.2 Calculate the length of RQ. (3)  
 3.3 Hence, calculate the size of  $\hat{S}$ . (2)  
 3.4 If P, Q and S lie in a straight line, how far apart are the anchors of the wire cables? (4)

# STATISTICS

Statistics is the study of data. Data can be ungrouped or grouped. Example 1 below is an example of ungrouped data and example 2 one of grouped data. You must be able to determine the mean, mode median of grouped and ungrouped data.

Mean, mode and median is referred to as the measures of central tendency. The measure of dispersion helps us to determine how the data is spread around the mean. Range and Interquartile range are measures of dispersion.

## Measures of central tendency (ungrouped data)

### Mean ( $\bar{x}$ )

The sum of all the values ( $x$ ) of the data set divided by the number of values ( $n$ ).

$$\bar{x} = \frac{\sum x}{n}$$

$$\sum = \text{sum of}$$

### Median ( $Q_2$ )

The middle value of an arranged data set.

Divides data in two equal sets.

The position of  $Q_2 = \frac{1}{2}(n + 1)$ .

### Mode

The value of the data set with the highest frequency/ most common value.

Arrange data in ascending order

### Example 1:

Consider the following set of marks (out of 50) for a mathematics test.

25	26	21	20	30	32	45	37	41	32
33	42	25	26	26	33	43	35	36	38

Determine the mean, median and mode.

### Solution:

#### Mean

$$\bar{x} = \frac{\sum x}{n}$$

$$= \frac{25 + 26 + 21 + 20 + 30 + 32 + 45 + 37 + 41 + 32 + 33 + 42 + 25 + 26 + 26 + 33 + 43 + 35 + 36 + 38}{20}$$

$$= \frac{646}{20} = 32,3$$

#### Median

20, 21, 25, 25, 26, 26, 26, 30, 32, 32, 33, 33, 35, 36, 37, 38, 41, 42, 43, 45.

Arrange data in ascending

Position of  $Q_2 = \frac{1}{2}(n + 1) = \frac{1}{2}(20 + 1) = 10,5^{th}$  value.

$\therefore Q_2$  lies between the 10<sup>th</sup> and 11<sup>th</sup> value.

$\therefore Q_2 = \frac{32+33}{2} = 32,5$  (When the position of  $Q_2$  falls between two values: find the sum of these values and divide it by 2)

#### Mode

26

Measures of central tendency (grouped data)

**Example 2:**

Find the estimated mean, median and mode of the data given below.

Class interval	Frequency
$0 \leq x \leq 20$	6
$20 < x \leq 40$	8
$40 < x \leq 60$	10
$60 < x \leq 80$	3
$80 < x \leq 100$	2

**Solution:**

Class interval	Frequency	Midpoint of class interval	Frequency $\times$ Midpoint $x$
$0 \leq x \leq 20$	6	10	60
$20 < x \leq 40$	8	30	240
$40 < x \leq 60$	10	50	500
$60 < x \leq 80$	3	70	210
$80 < x \leq 100$	2	90	180
	29		1190

**Estimated Mean**

$$\begin{aligned} \bar{x} &= \frac{\sum x}{n} \\ &= \frac{1190}{29} \\ &= 41,03 \end{aligned}$$

**Median**

Position of  $Q_2 = \frac{1}{2}(n + 1) = \frac{1}{2}(29 + 1) = 15^{th}$  value.

The  $15^{th}$  value falls in the  $40 < x \leq 60$  class interval.

$\therefore Q_2 = 50$  (Midpoint of class interval.)

**Mode**

$$40 < x \leq 60$$

**Explanation of the solution**

**Calculating the estimated mean.**

1. Create additional columns **Midpoint of class interval** and **Frequency  $\times$  Midpoint**.

2. Calculate the **Midpoint of class interval** and the **Frequency  $\times$  Midpoint**.

2.1 **Midpoint of class interval** = 
$$\frac{\text{lower limit of class} + \text{upper limit of class}}{2}$$

2.2 Multiply the frequency column with the midpoint column for each class interval.

3. Calculate the sum of the **Frequency** column to find the “ $n$ ” value.

4. Calculate the sum of the **Frequency  $\times$  Midpoint** column to find the “ $\sum x$ ” value.

5. Substitute Step 3 and 4 into  $\bar{x} = \frac{\sum x}{n}$  to find the estimated mean.

**Median.**

- Find the position of  $Q_2$ .
- Determine in which class interval the position of  $Q_2$  falls.
- Use the class midpoint as the value of  $Q_2$ .

**Mode**

The class interval with the highest frequency.

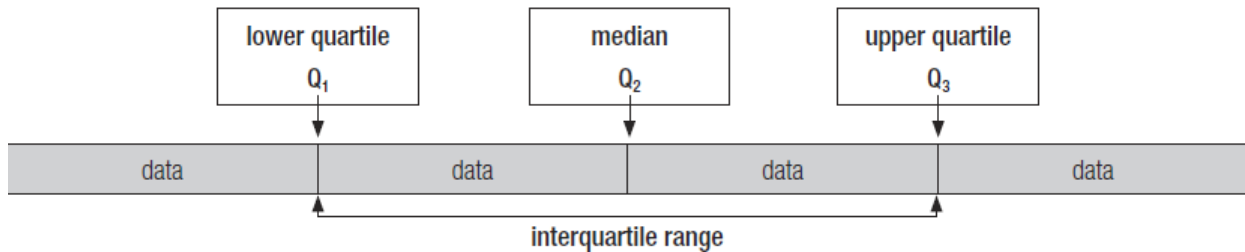


## Measures of dispersion

**Range:** Is the difference between the highest value (or maximum) and the lowest value (or minimum)  
= Largest value – smallest value

**Interquartile range:** Is the difference between the lower quartile ( $Q_1$ ) and the upper quartile ( $Q_3$ )

$$IQR = Q_3 - Q_1$$



## Quartiles

Quartiles: Divides an arranged data set into quarters.

- Lower quartile ( $Q_1$ )
- Median ( $Q_2$ )
- Upper quartile ( $Q_3$ )

The position of  $Q_1 = \frac{1}{4}(n + 1)$ .

The position of  $Q_3 = \frac{3}{4}(n + 1)$ .

### Example 3:

Determine the lower quartile, upper quartile, range, interquartile range and semi – interquartile range of the data below.

20, 21, 25, 25, 26, 26, 26, 30, 32, 32, 33, 33, 35, 36, 37, 38, 41, 42, 43, 45

### **Solution**

#### **Lower quartile ( $Q_1$ )**

$$\begin{aligned} \text{The position of } Q_1 &= \frac{1}{4}(n + 1) \\ &= \frac{1}{4}(20 + 1) \\ &= 5,25^{th} \text{ position.} \\ \therefore Q_1 &= \frac{26 + 26}{2} = 26 \end{aligned}$$

#### **Upper quartile ( $Q_3$ )**

$$\begin{aligned} \text{The position of } Q_3 &= \frac{3}{4}(n + 1) \\ &= \frac{3}{4}(20 + 1) \\ &= 15,75^{th} \text{ position.} \\ \therefore Q_3 &= \frac{37 + 38}{2} = 37,5 \end{aligned}$$

$$\text{Range} = 45 - 20 = 25$$

$$IQR = Q_3 - Q_1 = 37,5 - 26 = 11,5$$

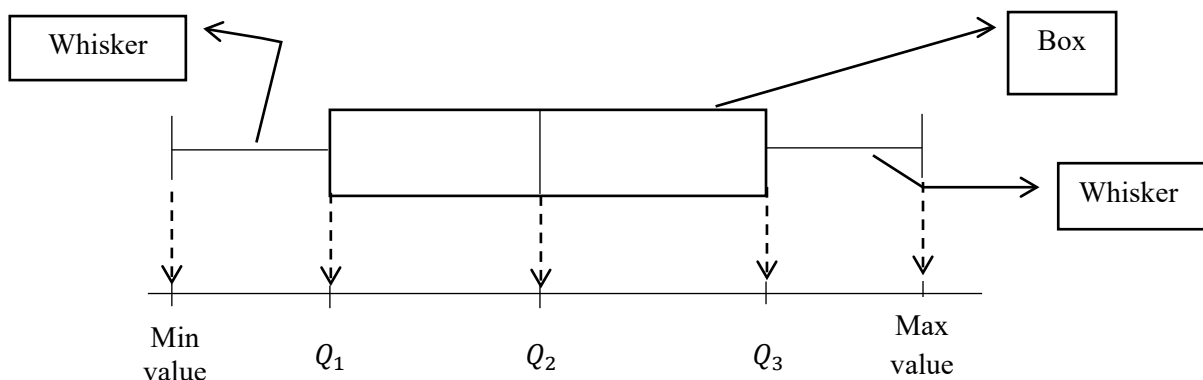
# The five number summary

The five number summary consists of the following measures of dispersion:

- ❖ The minimum value of the data set
- ❖  $Q_1$ ..... 25%
- ❖  $Q_2$  50% median
- ❖  $Q_3$ .....75%
- ❖ The maximum value of the data set

## Box and whisker diagram

The Box and Whisker diagram is a graphical representation of the five number summary.



### Drawing tips

Diagram must always have a box and whiskers.  
Clearly show the five number summary on axis.

### Important conclusions from box and whisker diagram.

- 25% of data lies between the minimum value and  $Q_1$ .
- 25% of data lies between  $Q_1$  and  $Q_2$ .
- 25% of data lies between  $Q_2$  and  $Q_3$ .
- 25% of data lies between  $Q_3$  and the maximum value.

### QUESTION 1

The data below shows the number of laptops sold by 15 sales agents during the last financial year.

43 48 62 52 46 90 58 37 48 73 84 68 54 34 78

- 1.1 Determine the median of the number of laptops sold. (2)
- 1.2 Calculate the range of the data. (2)
- 1.3 Calculate the interquartile range (IQR). (3)
- 1.4 Draw a box and whisker diagram for the data above. (3)

### QUESTION 2

A learner did a project on climate change. At 14:00 each day, she recorded the temperature (in °C) for a certain town. The information is given in the frequency table below.

TEMPERATURE (IN °C)	FREQUENCY
$20 \leq T < 24$	2
$24 \leq T < 28$	4
$28 \leq T < 32$	9
$32 \leq T < 36$	5
$36 \leq T < 40$	7
$40 \leq T < 44$	3

- 2.1 For how many days did the learner collect the data? (1)
- 2.2 Write down the modal class for the data. (1)
- 2.3 Estimate the mean of the data. (3)
- 2.4 Calculate the percentage of days on which the temperature was at least 28°C. (2)

### QUESTION 3

The height of 20 children were measured (in centimetres) and the results were recorded. The data collected is given in the table below.

127	128	129	130	131	133	134	134	135	136
137	138	139	140	141	142	142	143	144	145

- 3.1 Write down the median height measured. (1)
- 3.2 Determine:
  - 3.2.1 The mean height. (2)
  - 3.2.2 The range (1)
  - 3.2.3 The interquartile range (3)
- 3.3 Draw a box and whisker diagram to represent the data. (2)

#### QUESTION 4

The intelligence quotient score (IQ) of a Grade 10 class is summarised in the table below.

<b>IQ INTERVAL</b>	<b>FREQUENCY</b>
$90 \leq x < 100$	4
$100 \leq x < 110$	8
$110 \leq x < 120$	7
$120 \leq x < 130$	5
$130 \leq x < 140$	4
$140 \leq x < 150$	2

- 4.1 Write down the modal class of the data. (1)  
4.2 Determine the interval in which the median lies. (2)  
4.3 Estimate the mean IQ score of this class of learners. (3)

#### QUESTION 5

Nineteen girls were required to complete a puzzle as quickly as possible. Their times (in seconds) were recorded and are shown below.

14 15 16 16 17 17 18 18 19 19  
19 20 21 21 22 23 24 24 29

- 5.1 Identify the median time taken by the girls to complete the puzzle. (1)  
5.2 Determine the lower and upper quartiles for the data. (2)  
5.3 Draw a box and whisker diagram to represent the data. (2)  
5.4 The five-number summary of the time (in seconds) taken by 19 boys to complete the same puzzle is (15; 19; 23; 26; 30).  
5.4.1 Calculate the interquartile range for the time taken by the boys. (2)  
5.4.2 If only one boy took 19 seconds to complete the puzzle, what percentage of the boys took at least 19 seconds to complete the puzzle? (1)  
5.5 In which group, the girls or the boys, did a larger number of learners complete the puzzle in less than 23 seconds? Justify your answer. (2)

#### QUESTION 6

The table below shows information about the number of hours 120 learners spent on their cellphones in the last week.

<b>NUMBER OF HOURS (<math>h</math>)</b>	<b>FREQUENCY</b>
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

- 6.1 Identify the modal class for the data. (1)  
6.2 Estimate the mean number of hours that these learners spent on their cellphones in the last week. (3)

### QUESTION 7

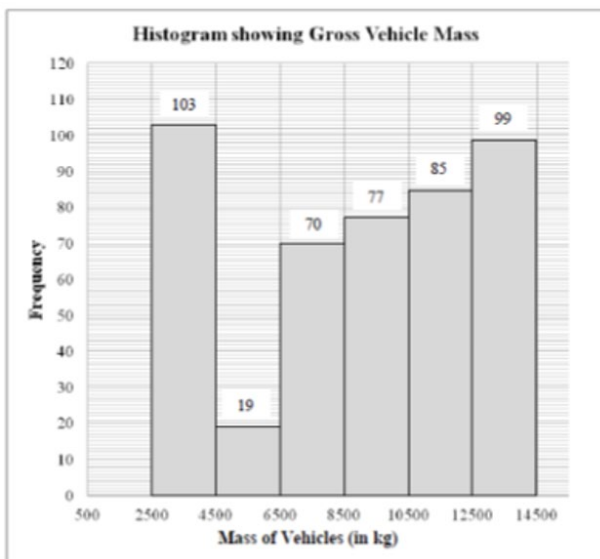
A baker keeps a record of the number of scones that he sells each day. The data for 19 days is shown below:

31 36 62 74 65 63 60 34 46 56  
37 46 40 52 48 39 43 31 66

- 7.1 Determine the mean of the given data. (2)
- 7.2 Rearrange the data in ascending order and then determine the median. (2)
- 7.3 Determine the lower and upper quartiles for the data. (2)
- 7.4 Draw a box and whisker diagram to represent the data. (2)

### QUESTION 8

Traffic authorities are concerned that heavy vehicles (trucks) are often overloaded. In order to deal with this problem, a number of weightbridges have been set up along the major routes in South Africa. The gross (total) vehicle mass is measured at these weigh bridges. The histogram below shows the data collected at a weighbridge over a month.



- 8.1 Write down the modal class of the data. (1)
- 8.2 Estimate the mean gross vehicle mass for the month. (5)
- 8.3 Which of the measures of central tendency, the modal class or the estimated mean, will be most appropriate to describe the data set? Explain your choice. (1)

# PROBABILITY

Probability is how likely it is that an event will happen.

For example,

- how likely is it that the sun will rise tomorrow?
- If I throw a die, how likely is it that I will get a 7?

## TERMINOLOGY:

**EVENT:** An event is an activity that has outcomes.

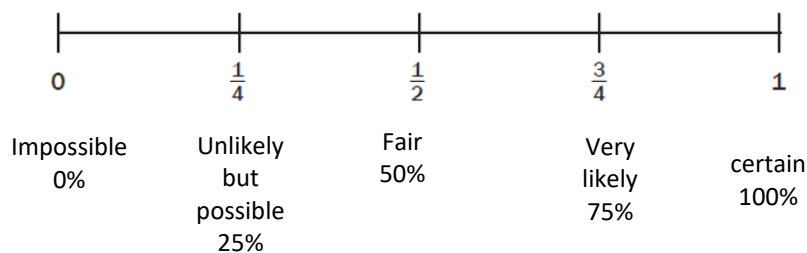
For example rolling an even number is an event with outcomes.

**OUTCOME:** Is the possible result of an event.

For example the event rolling an even number has 2, 4 and 6 as possible results.

**SAMPLE SPACE:** The set of all possible outcomes.

A probability scale is used to decide what the chance is that an event will happen.



The probability can be calculated using the following formula:

$$\text{Probability} = \frac{\text{number of favourable outcomes}}{\text{number of possible outcomes}}$$

This ratio can be expressed as a fraction, decimal or percentage.

Probability is always between 0 and 1, when expressed as a fraction or decimal.

Probability can also be between 0% and 100% when expressed as a percentage.

When answering probability questions it helps to represent information visually.

Tree Diagrams, Venn Diagrams and contingency tables can be used. Sometimes in probability questions information is given in a Tree Diagram, Venn Diagram or contingency table.

## TREE DIAGRAMS

Consider the following example to understand how a tree diagram is drawn.

Example:

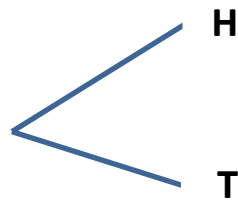
A coin is tossed twice. What is the probability that it lands on,

- a) heads on both occasions?
- b) Heads then tails?
- c) Once on heads and once on tails?

Solution:

On each toss there are two possible outcomes, either Heads (H) or Tails(T).

So the outcomes of the first toss can be represented as follows on a tree diagram.

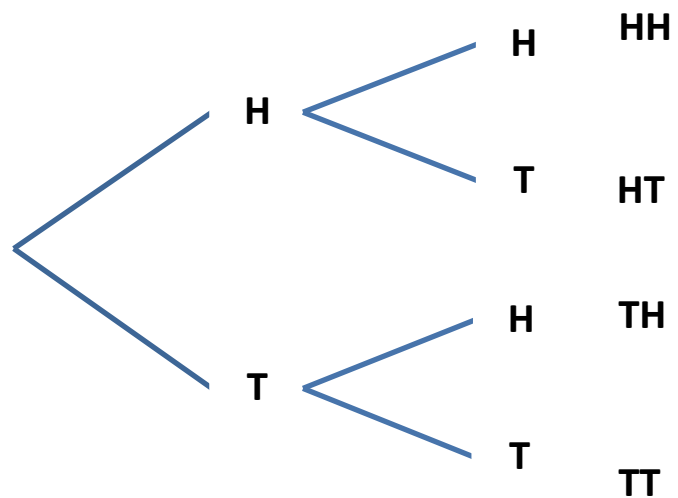


**NB:**

$$P(H) = \frac{1}{2} \quad , \quad P(T) = \frac{1}{2}$$

$$P(H) + P(T) = 1$$

After the second toss of the coin, the following tree diagram give all possible outcomes.



So after tossing the coin twice there are altogether four different outcomes:  
HH, HT, TH or TT

a) So the probability of getting HH is:  $\frac{\text{number of times you get HH}}{\text{number of all possible outcomes}} = \frac{1}{4}$

b) Probability of HT:  $\frac{\text{number of times you get HT}}{\text{number of all possible outcomes}} = \frac{1}{4}$

Probability of HT or TH:  $\frac{\text{number of times you get HT or TH}}{\text{number of all possible outcomes}} = \frac{2}{4} = \frac{1}{2}$

**Note:**

$$P(HH) + P(HT) + P(TH) + P(TT)$$

$$= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

$$= 1$$

$$P(HH) = P(H) \times P(H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$P(HT) = P(H) \times P(T) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

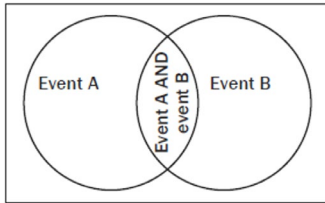
$$P(TH) = P(T) \times P(H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$P(TT) = P(T) \times P(T) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

## VENN DIAGRAMS

Venn Diagrams are used to solve probability questions. The given sketch is an example of a Venn Diagram. The rectangle S represent the Sample space with all possible outcomes. Each oval/circle represent an event in the sample space.

S (sample space)



### Notation:

$P(A)$ : this represent the probability of event A

$A'$ : the complement of A , that is all outcomes in the sample space (S) other than event A i.e  $A'$  is (notA).

A and B: are all the outcomes which are in event A and in event B. It is that which is in the intersection of the two events.

A or B: are all the outcomes which are in A, B as well as in the intersection of A and B,

### Example 1:

Draw a Venn diagram to show the sample space.

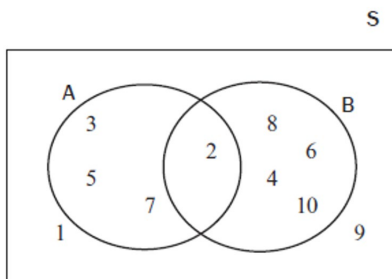
$S = \{ 1; 2; 3; 4; 5; 6; 7; 8; 9; 10\}$

Indicate the following events in the sample space

Event A is the set of prime numbers.  $\therefore A = \{2; 3; 5; 7\}$

Event B is the set of even numbers.  $\therefore B = \{2; 4; 6; 8; 10\}$

**Solution:**



### Explanation:

Notice that 2, is an outcome in both event A and event B. That is why we know that event A and B must be drawn so that there is an intersection. 2 is then placed in the intersection.

Now enter the other outcomes of event A and B. Note that there are some outcomes in the sample space which is not in event A or B, add these outcomes in the rectangle which represent the sample space.

### Example 2:

Determine each of the following for the Venn diagram in example 1.

- $P(A)$
- $P(B)$
- $P(A \text{ and } B)$
- $P(A \text{ or } B)$

### Solution:

$$a) P(A) = \frac{\text{no of outcomes in event A}}{\text{no of all possible outcomes}} = \frac{4}{10}$$

$$b) P(B) = \frac{\text{no of outcomes in event B}}{\text{no of all possible outcomes}} = \frac{5}{10}$$

$$c) P(A \text{ and } B) = \frac{\text{no of outcomes in event A and also event B}}{\text{no of all possible outcomes}} = \frac{1}{10}$$

$$d) P(A \text{ or } B) = \frac{\text{no of outcomes in event A, B}}{\text{no of all possible outcomes}} = \frac{8}{10}$$

**Note the following from the above example:**

$$P(A \text{ or } B) = \frac{8}{10}$$



$$P(A) + P(B) - P(A \text{ and } B)$$

$$= \frac{4}{10} + \frac{5}{10} - \frac{1}{10}$$

$$= \frac{8}{10}$$

i.e.

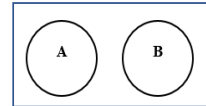
$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

**Addition Rule: where A and B are two events**

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

## MUTUALLY EXCLUSIVE EVENTS

Mutually exclusive events are events that cannot happen at the same time. There is no intersection between the events.



If the two events are mutually exclusive (cannot occur at the same time) then:

- $P(A \text{ and } B) = 0$  [No intersection]
- $P(A \text{ or } B) = P(A) + P(B)$

If,

- $P(A \text{ and } B) = 0$  [No intersection]

or

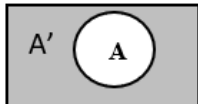
- $P(A \text{ or } B) = P(A) + P(B)$

Then events A and B are mutually exclusive.

## Complimentary Events

**The complementary rule:**

$$P(\text{not } A) = P(A') = 1 - P(A)$$



### QUESTION 1

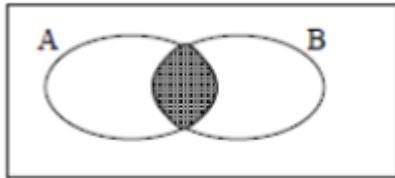
Two events, A and B, are complementary and make up the entire sample space. Also,  $P(A') = 0,35$ .

- 1.1 Complete the statement:  $P(A) + P(B) = \dots$  (1)  
1.2 Write down the value of  $P(A \text{ and } B)$  (1)  
1.3 Write down the value of  $P(B)$  (1)

### QUESTION 2

What expression BEST represents the shaded area of the following Venn diagrams?

- 2.1 (1)



2.1.1



2.1.2

- 2.2 State which of the following sets of events is mutually exclusive: (1)

A Event 1: The learners in Grade 10 in the swimming team  
Event 2: The learners in Grade 10 in the debating team

B Event 1: The learners in Grade 8  
Event 2: The learners in Grade 12

C Event 1: The learners who take Mathematics in Grade 10  
Event 2: The learners who take Physical Science in Grade 10

### QUESTION 3

- 3.1 Complete the following statement: (1)  
If A and B are two mutually exclusive events, then  
 $P(A \text{ and } B) = \dots$
- 3.2 Given that A and B are mutually exclusive events. The probability that event A occurs is 0,55. The probability that event B does occur is 0,7.  
Calculate  $P(A \text{ or } B)$ . (3)

### QUESTION 4

A bag contains 3 blue balls and  $x$  yellow balls.

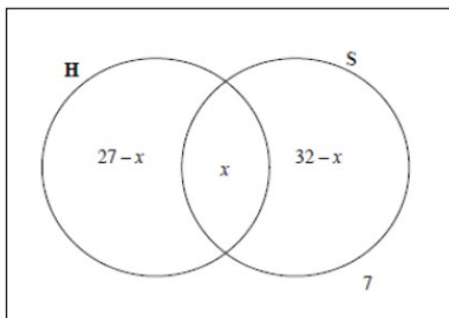
- 4.1 Write down the total number of balls in the bag. (1)  
4.2 If a ball is drawn from the bag, write down the probability that it is blue. (2)

### QUESTION 5

In a certain class of 42 boys:

- 27 play hockey (H)
- 32 play soccer(S)
- 7 do not play hockey or soccer
- An unknown number ( $x$ ) play both hockey and soccer

The information is represented in the Venn diagram below.



- 5.1 Calculate the value of  $x$ . (2)
- 5.2 If a boy from the class is chosen at random, calculate the probability that he:
- a) Does not play hockey or soccer (1)
  - b) Plays only soccer (2)

### QUESTION 6

A survey was conducted among 150 learners in Grade 10 at a certain school to establish how many of them owned the following devices: smartphone (S) or tablet (T).

The results were as follows:

- 8 learners did not own either a smartphone or a tablet.
- 20 learners owned both a smartphone and a tablet.
- 48 learners owned a tablet.
- $x$  learners owned a smartphone.

- 6.1 Represent the information above in a Venn diagram. (4)
- 6.2 How many learners owned only a smartphone? (3)
- 6.3 Calculate the probability that a learner selected at random from this group:
- a) Owned only a smartphone (1)
  - b) Owned at most one type of device (2)

### QUESTION 7

In a class of 40 learners the following information is TRUE:

- 7 learners are left-handed
- 18 learners play soccer
- 4 learners play soccer and are left-handed
- All 40 learners are either right-handed or left-handed

Let L be the set of all left-handed people and S be the set of all learners who play soccer.

- 7.1 How many learners in the class are right-handed and do NOT play soccer? (1)
- 7.2 Draw a Venn diagram to represent the above information. (4)
- 7.3 Determine the probability that a learner is:
- a) Left-handed or plays soccer (3)
  - b) Right-handed and plays soccer (2)

### QUESTION 8

At a certain school there are 64 boys in Grade 10. Their sport preference are indicated below:

- 24 boys play soccer
- 28 boys play rugby
- 10 boys play both soccer and rugby
- 22 boys do not play soccer or rugby

- 8.1 Represent the information above in a Venn diagram. (5)
- 8.2 Calculate the probability that a Grade 10 boy at the school, selected at random plays:
- a) Soccer and rugby (1)
- b) Soccer or rugby (1)
- 8.3 Are the events a Grade 10 boy plays soccer at the school and a Grade 10 boy plays rugby at the school, mutually exclusive? Justify your answer. (2)

### QUESTION 9

One morning Samuel conducted a survey in his residential area to establish how many passengers, excluding the driver, travel in a car. The results are shown in the table below: (3)

Number of passengers, excluding the driver	0	1	2	3	4
Number of cars	7	11	6	5	1

Calculate the probability that, excluding the driver, there are more than two passengers in a car.

### QUESTION 10

If you throw two dice at the same time, the probability that a six will be shown on one of the dice is  $\frac{10}{36}$  and the probability that a six will be thrown on both the dice is  $\frac{1}{36}$ . (3)

What is the probability that a six will NOT show on either of the dice when you throw two dice at the same time.

# Financial Mathematics

## Terminology:

**Interest:** is money earned when money is saved in the bank or it is money you have to pay on money you borrowed.

**Simple Interest:** Is the interest on an initial (principal) sum of money. Each year you receive or are charged the same amount of interest.

**Compound Interest:** Is also interest on an initial (principal) sum of money. If the interest is paid yearly for each year the principal amount, is the previous years final amount. The previous years final amount plus the interest for that year.

### Simple Interest:

$$A = P(1 + i \cdot n)$$

**A:** is the accumulated amount or final amount

**P:** is the principal amount or the original sum of money invested or borrowed

**i :** is the interest rate

**n :** is the number of periods, that is the number of years if interest is paid yearly or number of months if interest is paid monthly

### Compound Interest:

$$A = P(1 + i)^n$$

**A:** is the accumulated amount or final amount

**P:** is the principal amount or the original sum of money invested or borrowed

**i :** is the interest rate

**n :** is the number of periods, that is the number of years if interest is paid yearly or number of months if interest is paid monthly

**Example 1:**

If you borrow R1000 at 12% simple interest for two years,  
how much will you owe after 2 years.

To do this we will do two methods:  
  
1. Reasoning  
2. Using formulae  
  
This will show you that the formula works and could be used later.

**Solution:**

**Method 1**

12% of R1 000 is R120

After two years you will owe:

$$R1\ 000 + R120 \text{ (interest for 1}^{\text{st}} \text{ year)} + R120 \text{ (interest for 2}^{\text{nd}} \text{ year)}$$
$$= R1\ 240$$

**Method 2:**

$$A = P(1 + i \cdot n)$$

$$P = R1\ 000, i = \frac{12}{100}, n = 2$$

A???: is the final amount which must be calculated

$$A = P(1 + i \cdot n)$$

$$= R1\ 000 \left( 1 + \frac{12}{100} \times 2 \right)$$

$$= R1\ 240$$

STEPS:  
  
• Identify which formulae will be used.  
• Write down using the variables in formulae what you are given.  
• Identify what it is you must calculate

**Example 2:**

If you borrow R1000 at 12% compound interest for two years,  
how much will you owe after 2 years.

To do this we will do two methods:  
  
3. Reasoning  
4. Using formulae  
  
This will show you that the formula works and could be used later.

**Solution:**

**Method 1**

Year 1: 12% of R1 000 is R120

Year 2: 12% of (R1 000 + R120) is R134,40

After two years you will owe:

$$R1\ 000 + R120 \text{ (interest for 1}^{\text{st}} \text{ year)} + R134,4 \text{ (interest for 2}^{\text{nd}} \text{ year)}$$
$$= R1\ 254,40$$

**Method 2:**

$$A = P(1 + i)^n$$

$$P = R1\ 000, i = \frac{12}{100}, n = 2$$

$A$ ???: is the final amount which must be calculated

$$A = P(1 + i)^n$$

$$= R1\ 000 \left( 1 + \frac{12}{100} \right)^2$$

$$= R1\ 254,40$$

**STEPS:**

- Identify which formulae will be used.
- Write down using the variables in formulae what you are given.
- Identify what it is you must calculate

So in example 1 and 2 above it was easy to do method 1 and 2, because the number of years were only 2. If the number of years or the number of times interest is paid increases method 1 will be longer more cumbersome and the chances of making errors increases, so it is better to do method 2 where one of the two formulae are used.

**Example 3:**

Babalwa invests R 5 000 at 10% p.a compounded monthly for 2 years.

- What is the value of Babalwa's investment after 2 years?
- How much interest has Babalwa earned?

**Solution:**

a)  $A = P(1 + i)^n$

$$P = R5\ 000,$$

$$i = \frac{10}{100} \div 12,$$

$$n = 2 * 12$$

$A$ ???: is the final amount which must be calculated

$$A = P(1 + i)^n$$

$$= R5\ 000 \left( 1 + \frac{0,1}{12} \right)^{2*12}$$

$$= R6101,95$$

**STEPS:**

- Identify which formulae will be used.
- Write down using the variables in formulae what you are given.
- Identify what it is you must calculate

**NB**

Take note how  $i$  and  $n$  was calculated  
Because it is compound monthly and there are 12 months in a year, the interest rate is divided by 12.

$n$  : is the number of times interest is paid, so over 2 years it is,  $2 \times 12 = 24$

### QUESTION 1

- 1.1 Seven years ago, Mrs Grey decided to invest R18 000 in a bank account that paid simple interest at 4,5% p.a.
- 1.1.1 Calculate how much interest Mrs Grey has earned over the 7 years. (2)
- 1.1.2 Mrs Grey wants to buy a television set that costs R27 660,00 now. If the average rate of inflation over the last 5 years was 6,7% p.a., calculate the cost of the television set 5 years ago. (3)
- 1.1.3 At what rate of simple interest should Mrs Grey have invested her money 7 years ago if she intends buying the television set now using only her original investment of R18 000 and the interest earned over the last 7 years? (3)
- 1.2 On a certain day the exchange rate between the US dollar and the South African rand is \$1 = R12,91. At the same time the exchange rate between the British pound and the South African rand is £1 = R16,52.  
Calculate the exchange rate between the British pound and US dollar on that day. (2)

### QUESTION 2

Mary wants to buy a fridge that costs R15 550. She has to pay a deposit of 15% of the cost and the balance by means of a hire-purchase agreement. The rate of interest on the loan is 16,25% p.a. simple interest. The repayment period of the loan is 54 months. In addition to the hire-purchase agreement, an annual insurance premium of 1,5% of the total cost of the fridge should be added. The annual insurance premium should be paid in monthly instalments.

- 2.1 Calculate the value of the loan that Mary will take. (2)
- 2.2 Calculate the total amount that must be repaid on the hire-purchase agreement. (3)
- 2.2 Calculate the monthly repayment, which includes the monthly insurance premium. (3)

### QUESTION 3

The table below shows the rand equivalent of one British pound and one US dollar.

COUNTRY	CURRENCY	RATE OF EXCHANGE OF THE RAND
Britain (United Kingdom)	Pound (£)	21,41
United States of America	Dollar (\$)	13,45

**A South African nurse works in the United States of America.**

- 3.1 The nurse saves the equivalent of R4 800 per month. Calculate the amount, in US (American) dollars, that she saves per month. (2)
- 3.2 She ordered a book from the United Kingdom (Britain) and paid \$85 for it. Calculate the price of the book in pounds (£) (3)

### QUESTION 4

**A sum of money doubles in 5 years when the interest is compounded annually. Calculate the rate of interest. (3)**



### QUESTION 5

Zach likes to travel. He has saved R5 000 as spending money for his vacation in Australia at the end of 2015.

- 5.1 Zach looks up the exchange rate on the Internet. Using the information in the table below, calculate how many Australian dollars Zach can buy for R5 000. (2)

SOUTH AFRICAN RAND RATES TABLE

FOREIGN CURRENCY	EQUIVALENT VALUE OF R1	RAND EQUIVALENT OF 1 UNIT OF CURRENCY
US dollar	0.083130	12,029313
Euro	0.074048	13,504730
British pound	0.053877	18,560961
Australian dollar	0.105058	9,518569

- 5.2 Zach plans to make another trip to Australia at the end of 2018.
- 5.2.1 5.2.1 Assume that the average annual rate of inflation in South Africa will be 6,1% over the next 3 years. In 2018, what amount of money will be equivalent to the value of R5 000 now? (3)
- 5.2.2 5.2.2 Zach plans to invest equal amounts into a savings account on 1 December 2016 and on 1 December 2017 to have accumulated an amount of R5 980 by 1 December 2018. If this account earns interest at 9% p.a. compounded annually, how much money should Zach deposit into the account on each occasion? (4)

### QUESTION 6

Thando has R4 500 in his savings account. The bank pays him a compound interest rate of 4,25% p.a. Calculate the amount Thando will receive if he decides to withdraw the money after 30 months. (3)

### QUESTION 7

The following advertisement appeared with regard to buying a bicycle on a hire-purchase agreement loan:

*Purchase price*            R5 999  
*Required deposit*        R600  
*Loan term*                Only 18 months, at 8% p.a. simple interest

- 7.1 Calculate the monthly amount that a person has to budget for in order to pay for the bicycle. (6)
- 7.2 How much interest does one have to pay over the full term of the loan? (1)

### QUESTION 8

The following information is given:

1 ounce = 28,35 g

\$1 = R8,79

Calculate the rand value of a 1kg gold bar, if 1 ounce of gold is worth \$978,34.

(4)



Western Cape  
Government

Western Cape Education Department  
**Directorate: Curriculum FET**

---

# Mathematics

MEMORANDUM TO

REVISION BOOKLET  
2023 TERM 3

Grade 10

QUESTION 1			
1.1	$\tan \hat{P} = \frac{10}{24} = \frac{5}{12}$	Accept answers as unsimplified fractions.	✓ answer/antw (1)
1.2	$\sin \hat{SQR} = \frac{6}{10} = \frac{3}{5}$		✓ answer/antw (1)
1.3	$\cos \theta = \frac{10}{26} = \frac{5}{13}$	Aanvaar antwoorde as nie-vereenvoudigde breuke.	✓ answer/antw (1)
QUESTION 2			
2.1.1	$5 \cos x = 3$ $\cos x = \frac{3}{5}$ $x = \cos^{-1}\left(\frac{3}{5}\right)$ $x = 53,1^\circ$		✓ $\cos x = \frac{3}{5}$ ✓ answer (2)
2.1.2	$\tan 2x = 1,19$ $2x = \tan^{-1}(1,19)$ $2x = 49,95845 \dots^\circ$ $x = 25^\circ$		✓✓ $2x = 49,958 \dots^\circ$ ✓ answer (3)
2.2			
2.2.1	$\hat{JKD} = 8^\circ$ alternate angles		✓ answer (1)
2.2.2	$\tan 8^\circ = \frac{5}{DK}$ $DK = \frac{5}{\tan 8^\circ}$ $DK = 35,57684 \dots \text{ km}$ $DK = 35\,577 \text{ m}$		✓ $\tan 8^\circ = \frac{5}{DK}$ ✓ $DK = \frac{5}{\tan 8^\circ}$ ✓ answer (3)
2.2.3	$DS = 35,58 - 8 = 27,58 \text{ km}$		✓ answer (1)
2.2.4	$\tan \hat{DSJ} = \frac{5}{27,58}$ $\hat{DSJ} = \tan^{-1}\left(\frac{5}{27,58}\right)$ $\hat{DSJ} = 10,3^\circ$		✓ $\tan \hat{DSJ} = \frac{5}{27,58}$ ✓ answer (2) [16]

QUESTION 3		
3.1	$\theta = 47^\circ$	✓ answ./antw. (1)
3.2	$\sin P = \frac{RQ}{RP}$ $\sin 47^\circ = \frac{RQ}{21}$ $RQ = 21 \sin 47^\circ$ $RQ = 15,36m$	✓ trig. ratio/trig. verhoud ✓ subst./verv. ✓ answ./antw. (3)
3.3	$\tan S = \frac{RQ}{QS}$ $\tan S = \frac{15,36}{17}$ $\hat{S} = \tan^{-1}\left(\frac{15,36}{17}\right)$ $\hat{S} = 42,10^\circ$	✓ subst./verv. ✓ answ./antw. (2)
3.4	$\cos 47^\circ = \frac{PQ}{21}$ $PQ = 21 \times \cos 47^\circ$ $PQ = 14,32m$ $PS = 14,32 + 17$ $= 31,32m$	✓ trig. ratio/trig. verhoud ✓ PQ = 14,32 m ✓ addition/optel ✓ answ./antw. (4)

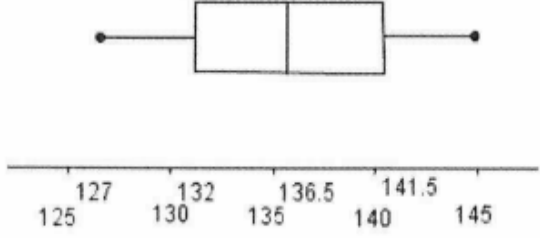
## STATISTICS

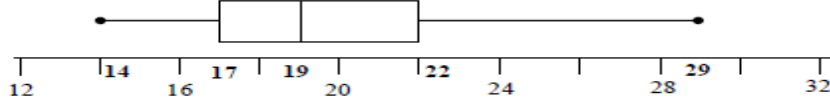
Question 1		
1.1	Median/Mediaan = 54	✓✓ answ./antw. (2)
1.2	Range/Variasiewydte = $90 - 34 = 56$	✓✓ answ./antw. (2)
1.3	$\text{IQR(IKV)} = Q_3 - Q_1$ $= 73 - 46$ $= 27$	✓ $Q_1 = 46$ ✓ $Q_3 = 73$ ✓ answ./antw. (3)
1.4		✓ min. & max./maks. ✓ median/mediaan ( $Q_2$ ) ✓ $Q_1$ and/en $Q_3$ (3)
<b>[10]</b>		

**QUESTION 2**

2.1	30 days/dae	✓ answ./antw. (1)
2.2	$28 \leq T < 32$	✓ answ./antw. (1)
2.3	The mean/Gemiddeld ( $\bar{X}$ ) = $\frac{44 + 104 + 270 + 170 + 266 + 126}{30}$	✓ addition/optel ✓ 30
2.4	$= \frac{980}{30}$	✓ answ./antw. (3)
	$= 32,666$	
	$= 32,67^{\circ}C$	
	$9 + 5 + 7 + 3 = 24$ days/dae	✓ addition/optel
	% of number of days/getal dae = $\frac{24}{30} \times 100$	✓ answ./antw. (2)
	$= 80\%$	
		[7]

**QUESTION 3**

3.1	$\text{Median/Mediaan} = \frac{136+137}{2}$ $= 136,5$	✓ answer/antwoord (1)
3.2.1	$\text{Mean/Gemiddelde} = \frac{2728}{20}$ $= 136,4 \text{ cm}$	✓ 2728 ✓ answer/antwoord Answer only/ slegs antw 2/2 (2)
3.2.2	$\text{Range/Variasiewydte} = 145 - 127$ $= 18 \text{ cm}$	✓ answer/antwoord (1)
3.2.3	$\text{Lower quartile/Onderste kwartiel} = 132$ $\text{Upper quartile/Boonste kwartiel} = 141 \frac{1}{2}$ $\text{Interquartile range/IKO} = 141 \frac{1}{2} - 132$ $= 9,5 \text{ cm}$	✓ Lower quartile/Onderste kwartiel ✓ Upper quartile/Boonste kwartiel ✓ answer/antwoord Answer only full marks Slegs antw volpunte (3)
3.3		✓ median/min/max/ mediaan/min/maks ✓ Q <sub>1</sub> and/ en Q <sub>3</sub> CA from 1.1 & 1.2.3 VA vanaf 1.1 & 1.2.3 (2) <b>[9]</b>

QUESTION 4		
4.1	Modal class( <i>Module klas</i> ) $100 \leq x < 110$	✓ answer/ <i>antwoord</i> Do not penalise notation <i>Notasie word nie gepenaliseer nie</i> (1)
4.2	$110 \leq x < 120$	✓✓ answer/ <i>antwoord</i> Note: if learner identifies position of median only: 1/2 <i>Nota: Indien leerder slegs posisie van mediaan bepaal: 1/2</i> (2)
4.3	Estimate Mean IQ of students/ <i>Geskatte gemiddelde IK</i> $= \frac{3480}{30}$ $= 116$	✓ 3480 ✓ 30  ✓ answer/ <i>antwoord</i> CA on numerator only <i>VA slegs vir teller</i> Answer only/ <i>Slegs antw</i> 3/3 (3) <b>[6]</b>
QUESTION 5		
	14 15 16 16 17 17 18 18 19 19 19 20 21 21 22 23 24 24 29	
5.1	Median/ <i>Mediaan</i> = 19 seconds/ <i>sekondes</i>	✓ answer/ <i>antw</i> (1)
5.2	Lower quartile/ <i>Onderste kwartiel</i> ( $Q_1$ ) = 17 Upper quartile/ <i>Boonste kwartiel</i> ( $Q_3$ ) = 22	✓ $Q_1$ ✓ $Q_3$ (2)
5.3		✓ box/ <i>mond</i> ✓ whiskers/ <i>snor</i> (2)
5.4.1	$IQR/IKO = 26 - 19$ $= 7$	✓ $Q_3 - Q_1$ ✓ answer/ <i>antw</i> (2)
5.4.2	75% of the boys took at least 19 seconds to complete the puzzle./ <i>75% van die seuns het ten minste 19 sekondes geneem om die legkaart te voltooi.</i>	✓ 75% (1)
5.5	About 50% but not more than 75% of the boys completed the puzzle in less than 23 seconds./ <i>Ongeveer 50% maar nie meer as 75% van die seuns het die legkaart in minder as 23 sekondes voltooi.</i> More than 75% of the girls completed the puzzle in less than 23 seconds./ <i>Meer as 75% van die dogters het die legkaart in minder as 23 sekondes voltooi.</i> Therefore more girls completed the puzzle in less than 23 seconds./ <i>Meer dogters het dus die legkaart in minder as 23 sekondes voltooi.</i>	✓ relevant/ <i>relevante explanation/verduideliking</i>  ✓ girls/ <i>dogters</i> (2) <b>[10]</b>

**QUESTION 6**

NUMBER OF HOURS <i>GETAL UUR (h)</i>	FREQUENCY <i>FREKWENSIE</i>
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

6.1	The modal class is/ <i>Die modale klas is</i> $6 < h \leq 8$	✓ $6 < h \leq 8$ (1)
6.2	<p>Average/<i>Gemiddelde</i> = <math>\frac{1 \times 10 + 3 \times 15 + \dots + 11 \times 5}{120}</math></p> <p>Estimated mean/<i>Geskatte gemiddelde</i> (<math>\bar{x}</math>) = <math>\frac{730}{120}</math> = 6,08 hours/<i>uur</i></p>	✓ midpts/ <i>midpte</i> ✓ 730 ✓ answer/ <i>antw</i> (3) [4]

**QUESTION 7**

7.1	$\text{Mean} = \frac{\sum_{i=1}^n x_i}{n} = \frac{929}{19} = 48,89$	✓ $\frac{929}{19}$ ✓ answer (2)
7.2	31 ; 31 ; 34 ; 36 ; 37 ; 39 ; 40 ; 43 ; 46 ; 46 ; 48 ; 52 ; 56 ; 60 ; 62 ; 63 ; 65 ; 66 ; 74.  Median = 46	✓ arranging in ascending order  ✓ median (2)
7.3	Lower quartile = 37 Upper quartile = 62	✓ lower quartile ✓ upper quartile (2)
7.4		✓ box with median ✓ whisker (2) [8]



**QUESTION 8**

8.1 The modal class is  $2500 \leq x < 4500$  ✓  
 $2500 \leq x < 4500$   
 (1)

8.2

Gross Vehicle Mass (GVM) (in kg)	Frequency	Midpoint	Frequency × midpoint
$2500 \leq x < 4500$	103	3500	360 500
$4500 \leq x < 6500$	19	5500	104 500
$6500 \leq x < 8500$	70	7500	525 000
$8500 \leq x < 10500$	77	9500	731 500
$10500 \leq x < 12500$	85	11500	977 500
$12500 \leq x < 14500$	99	13500	1 336 500
Sum	453		4 035 500

Estimated mean  $(\bar{X}) = \frac{4035500}{453} = 8908,39 \text{ kg.}$

✓ midpoints  
 ✓✓ frequencies × midpoint  
 ✓ 4 035 500  
 ✓ answer  
 (5)

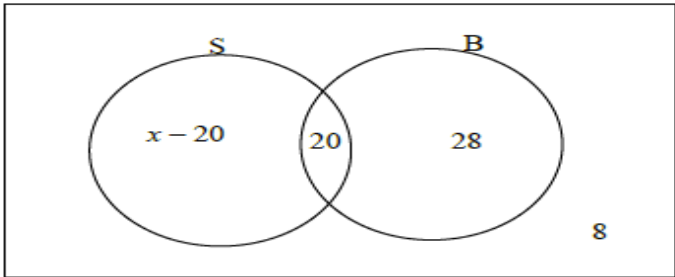
8.3 The estimated mean.  
 It is more at the centre of the data set. The modal class is found at the extreme left-hand side of the data set. ✓ estimated mean with reason  
 (1)  
 [7]

# PROBABILITY

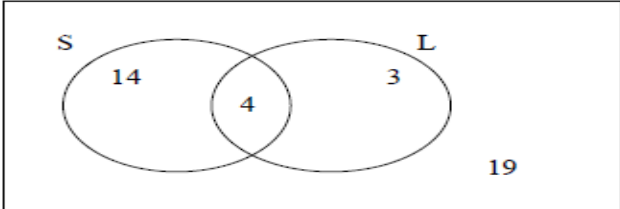
QUESTION 1		
1.1	$P(A) + P(B) = 1$	✓ answ/antw (1)
1.2	$P(A \text{ and } B) = 0$	✓ answ/antw (1)
1.3	$P(B) = P(A')$ $= 0,35$	✓ answ/antw (1)
QUESTION 2		
2.1.1	$A \cap B$ OR A and B	✓ answer (1)
2.1.2	$A'$ OR not A	✓ answer (1)
2.2	B	✓ answer (1)
QUESTION 3		
3.1	$P(A \text{ and/en } B) = 0$	✓ answer/antwoord (1)
3.2	$P(B) = 1 - P(B')$ $= 1 - 0,7$ $= 0,3$ $P(A \text{ or/of } B) = P(A) + P(B)$ $= 0,55 + 0,3$ $= 0,85$	✓ $P(B) = 0.3$ ✓ subst./vervang ✓ answer/antwoord (3) [12]
QUESTION 4		
4.1	$x + 3$	✓ answer/antwoord (1)
4.2	$P(\text{blue/blou}) = \frac{3}{x + 3}$	✓✓ answer/antwoord (2)
QUESTION 5		
5.1	$27 - x + x + 32 - x + 7 = 42$ $-x = 42 - 66$ $x = 24$	✓ equation/vergeliking ✓ answer/antwoord (2)
5.2 a)	P(does not play hockey or soccer/speel nie hokkie of sokker) $= \frac{7}{42}$ <b>OR/OF</b> $= \frac{1}{6}$	✓ answer/antwoord (1)



QUESTION 6

6.1	<p><math>S = 150</math></p> 	<p>✓20 ✓28 ✓<math>x - 20</math> ✓8</p> <p>(4)</p>
6.2	$x - 20 + 20 + 28 + 8 = 150$ $x = 114$ <p>Smartphone only/Slegs slimfoon = <math>114 - 20</math> = 94</p>	<p>✓ equation/verg. ✓ value/waarde of/van <math>x</math> ✓ answ/antw</p> <p>(3)</p>
6.3 a)	$P(\text{S only/slegs}) = \frac{94}{150} = 0,63$	<p>✓ answ/antw</p> <p>(1)</p>
b)	$P(\text{S or/of T or neither/of geeneen}) = \frac{94}{150} + \frac{28}{150} + \frac{8}{150}$ $= \frac{130}{150}$ $= \frac{13}{15}$ $= 0,87$	<p>✓ addition/optel</p> <p>✓ answ/antw</p> <p>(2)</p>

QUESTION 7

7.1	19 learners are right-handed and do not play soccer.	<p>✓ answer</p> <p>(1)</p>
7.2		<p>✓ 15 ✓ 4 ✓ 2 ✓ 19</p> <p>(4)</p>
7.3 a)	$P(\text{L OR S}) = \frac{14 + 4 + 3}{40}$ $= \frac{21}{40}$	<p>✓ <math>15 + 4 + 2</math> ✓ 40 ✓ answer</p> <p>(3)</p>
b)	$P(\text{R AND S}) = \frac{14}{40}$ $= \frac{7}{20}$	<p>✓ <math>\frac{15}{40}</math> ✓ answer</p> <p>(2)</p> <p>[13]</p>

**QUESTION 8**

8.1	<p style="text-align: center;">Sample space/Steekproefruimte (64)</p> <p style="text-align: center;">Soccer/sokker (24)      Rugby (28)</p> <p style="text-align: center;">14      10      18</p> <p style="text-align: right;">22</p>	<ul style="list-style-type: none"> <li>✓ diagram shape/ diagramvorm</li> <li>✓ 14 in correct position/ in korrekte posisie</li> <li>✓ 10 in correct position/ in korrekte posisie</li> <li>✓ 18 in correct position/ in korrekte posisie</li> <li>✓ 22 in correct position/ in korrekte posisie</li> </ul> <p style="text-align: right;">(5)</p>
8.2 a)	$P(\text{Soccer and Rugby}) = \frac{10}{64} = \frac{5}{32} = 0,15625 = 15,63\%$	<ul style="list-style-type: none"> <li>✓ answer (in any form)/ antwoord (in enige vorm)</li> </ul> <p style="text-align: right;">(1)</p>
b)	$P(\text{Soccer or Rugby}) = \frac{14 + 10 + 18}{64} = \frac{42}{64} = \frac{21}{32} = 0,65625 = 65,63\%$ <p><b>OR / OF</b></p> $P(\text{Soccer or Rugby}) = 1 - \frac{22}{64} = \frac{21}{32}$	<ul style="list-style-type: none"> <li>✓ answer (in any form)/ antwoord (in enige vorm)</li> </ul> <p style="text-align: right;">(1)</p>
8.3	<p>No/Nee. Some boys play both soccer and rugby/Party seums speel sokker en rugby.</p> <p><b>OR/OF</b></p> <p>No/Nee <math>P(S \text{ and } R) \neq 0 / P(S \text{ en } R) \neq 0</math></p>	<ul style="list-style-type: none"> <li>✓ No/Nee</li> <li>✓ Reason/Rede</li> </ul> <p style="text-align: right;">(2)</p> <ul style="list-style-type: none"> <li>✓ No/Nee</li> <li>✓ Reason/Rede</li> </ul> <p style="text-align: right;">(2)</p>

**QUESTION 9**

$P(\text{more than 2 passengers per car}) / P(\text{meer as 2 passasiers per kar})$ $= \frac{5 + 1}{7 + 11 + 6 + 5 + 1}$ $= \frac{6}{30}$ $= \frac{1}{5} = 0,2 = 20\%$	<ul style="list-style-type: none"> <li>✓ numerator/teller 6</li> <li>✓ denominator/ noemer 30</li> <li>✓ answer/antwoord (accept/aanvaar</li> <li><math>\frac{6}{30}</math> or <math>\frac{1}{5}</math> or/of</li> <li>0,2 or/of 20%)</li> </ul> <p style="text-align: right;">(3)</p>
--	--

**QUESTION 10**

$P(\text{not getting a six}) / P(\text{nie 'n ses kry nie})$ $= 1 - \left( \frac{10}{36} + \frac{1}{36} \right)$ $= \frac{25}{36}$	<ul style="list-style-type: none"> <li>✓ <math>\left( \frac{10}{36} + \frac{1}{36} \right)</math></li> <li>✓ <math>1 - \left( \frac{10}{36} + \frac{1}{36} \right)</math></li> <li>✓ <math>\frac{25}{36}</math></li> </ul> <p style="text-align: right;">(3)</p> <p style="text-align: right;"><b>[15]</b></p>
--	--

# FINANCIAL MATHEMATICS

QUESTION 1		
1.1	$SI = \frac{Prt}{100}$ $= \frac{18000 \times 4,5 \times 7}{100}$ $= R5670,00$ <p><b>OR/OF</b></p> $A = P(1 + i.n)$ $= 18000(1 + 0,045 \times 7)$ $= R23670$ <p>Interest/Rente = 23670 – 18000</p> $= R5670$	✓ subst./verv.  ✓ answ/antw  <b>OR/OF</b>  ✓ R23 670  ✓ R5 670  (2)
1.1.1		
1.1.2	$A = P(1 + i)^n$ $R27660 = P(1 + 0,067)^5$ $P = \frac{27660}{(1 + 0,067)^5}$ $P = R20000$	✓ subst./verv. in correct formula/ korrekte formule  ✓ simpl./vereenv ✓ answ/antw  (3)
1.1.3	$A = P(1 + i.n)$ $27660 = 18000(1 + i \times 7)$ $7i = \frac{27660}{18000} - 1$ $i = \frac{\frac{27660}{18000} - 1}{7}$ $i = 0,07666\dots$ <p>Simple interest rate should have been/ Eenvoudige rente moes wees 7,67%</p>	✓ subst./verv.  ✓ simpl./vereenv  ✓ answ/antw  (3)
1.2	$\frac{\text{Pound/Pond}}{\text{Dollar}} = \frac{R16,52}{R12,91}$ $\therefore \text{£}1 \approx \$1,28$ <p><b>OR/OF</b></p> $\frac{\text{Dollar}}{\text{Pound/Pond}} = \frac{R12,91}{R16,52}$ $\therefore \$1 \approx \text{£}0,78$	✓ proportion/verhouding  ✓ £1 ≈ \$1,28  <b>OR/OF</b> ✓ proportion/verhouding  ✓ \$1 ≈ £0,78  (2)
		<b>[10]</b>

**QUESTION 2**

<p>2.1</p>	<p>The cash deposit/<i>Kontantdeposito</i>  <math>= 0,15 \times R15550</math>  <math>= R 2332,50</math></p> <p>The value of loan/<i>Waarde van lening</i>  <math>= R15550 - R2332,50</math>  <math>= R13217,50</math></p> <p><b>OR/ OF</b></p> <p>The value of loan/<i>Waarde van lening</i>  <math>= 85\% \text{ of } 15550</math>  <math>= R13217,50</math></p>	<p>✓ deposit/<i>deposito</i></p> <p>✓ ans/<i>ant</i> (2)</p> <p>✓ 85% of loan/<i>85% van lening</i>          ✓ ans/<i>ant</i> (2)</p>
<p>2.2</p>	<p><math>A = P(1 + i.n)</math>  <math>= 13217,50 \left( 1 + 0,1625 \times \frac{54}{12} \right)</math>  <math>= R22 882,80</math></p> <p><b>OR/ OF</b></p> <p><math>SI = P.i.n</math>  <math>= 13217,50(0,1625)(4,5)</math>  <math>= R9665,30</math></p> <p><math>A = SI + P</math>  <math>= R9665,30 + R13217,50</math>  <math>= R22 882,80</math></p>	<p>✓ <math>A = P(1 + i.n)</math>          ✓ correct sub into correct formula/<i>vervang in korrek formule.</i>          ✓ ans/<i>ant</i> (3)</p> <p>✓ <math>SI = R9665,30</math>          ✓ <math>A = Pin + P</math>          ✓ ans/<i>ant</i> (2)</p>
<p>2.2</p>	<p>Annual Insurance premium/<i>Per jaar versekeringspremie</i>  <math>= 0,015 \times 15 550</math>  <math>= R 233,25 \text{ per annum/per jaar}</math></p> <p>Monthly payments/<i>Maandelikse paaieiment</i>  <math>= \frac{22882,80}{54} + \frac{233,25}{12}</math>  <math>= R 443,19</math></p> <p><b>OR/ OF</b></p> <p><math>AIP = 233,25 \times 4,5</math>  <math>= R1049,63</math></p> <p>Monthly payments/<i>Maandelikse paaieiment</i>  <math>= \frac{22882,80 + 1049,63}{54}</math>  <math>= R 443,19</math></p>	<p>✓ instalment per Month/<i>paaieiment per maand</i>          ✓ insurance per month/<i>versekering per maand</i>          ✓ ans/<i>ant</i> (3)</p> <p>✓ insurance for/<i>versekering vir</i> 4,5 years/<i>jaar</i>          ✓ Instalment per month /<i>paaieiment per maand</i>          ✓ ans/<i>ant</i> (3)</p>

**QUESTION 3**

<p>3.1</p>	<p><math>\\$1 = R 13,45</math>  <math>\\$x = R4 800</math>  <math>\\$x = \frac{4800}{13,45}</math>  <math>= \\$356,88</math></p>	<p>✓ division by/ <i>deel deur</i> 13,45          ✓ answer/ <i>antwoord</i> (2)</p>
------------	--	---





QUESTION 6

$$\begin{aligned}
 A &= P(1+i)^n \\
 &= 4500\left(1 + \frac{4.25}{100}\right)^{2.5} \\
 &= R\ 4993.47
 \end{aligned}$$

- ✓  $n = 2.5$
- ✓ substitution
- ✓ answer

(3)

QUESTION 7

7.1

$$\begin{aligned}
 \text{Loan amount} &= R5\ 999 - R600 \\
 &= R5\ 399 \\
 \\
 \text{Total amount owed} &= 5\ 399[1+(0,08)(1,5)] \\
 &= R6\ 046,88 \\
 \\
 \text{Monthly instalment} &= \frac{6046.88}{18} \\
 &= R335,94
 \end{aligned}$$

- ✓  $y = 0$
- ✓ 5 399
- ✓  $n = 1,5$
- ✓ Substitution
- ✓ R6 046,88
- ✓ ÷ 18
- ✓ R335,94

(6)

7.2

$$\begin{aligned}
 &R6\ 046,88 - R5\ 399 \\
 &= R647,88
 \end{aligned}$$

- ✓ answer

(1)

QUESTION 8

$$\begin{aligned}
 1\ \text{kg} &= 1\ 000\ \text{g} \\
 \frac{1000}{28,35} &= 35,27336861\dots\ \text{ounces} \\
 35,27336861\dots \times 978,34 \times 8,79 \\
 &= R303\ 337,16
 \end{aligned}$$

- ✓ conversion
- ✓ division
- ✓ multiplication
- ✓ answer

(4)  
[14]