



MATHEMATICAL LITERACY: PAPER I

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 11 pages, 5 questions, an **Answer Booklet** of 3 pages (i – iii) and an Annexure Sheet of 1 page: **Annexure A. Detach the Answer Booklet** from the centre of the question paper. Hand it in with your Answer Book.
 2. Ensure that your question paper is complete.
 3. Answer ALL the questions.
 4. Start each question on a new page.
 5. Number the answers exactly as the questions are numbered.
 6. An approved calculator (non-programmable, non-graphical) may be used.
 7. ALL necessary calculations must be clearly shown.
 8. Units of measurement must be included where applicable.
 9. Round off final answers to two decimal places, unless specified otherwise.
 10. It is in your own interest to write legibly and present your work neatly.
 11. Maps and diagrams are not necessarily drawn to scale unless stated otherwise.
-

QUESTION 1

1.1 Calculate:

1.1.1 $34,7 - 12^3 \times 0 \div 4$ (2)

1.1.2 40% of 2 050 g (2)

1.1.3 $\frac{2}{5}$ of 1 million (2)

1.1.4 P if $12 : 60 = P : 15$ (2)

1.2 Nahim's average running speed is 6,2 km per hour.
On Tuesday he ran for 2 hours and 25 minutes.

1.2.1 Convert the time he ran on Tuesday to hours. (2)

1.2.2 Calculate the distance that Nahim ran on Tuesday if he ran consistently at his average speed for the entire run. (2)

$$\text{Distance} = \text{Speed} \times \text{Time}$$

1.3 The maximum weight that a shelf can hold is 2 kg. Calculate the maximum number of items, each with a mass of 135 g, that could be placed on the shelf. (3)

1.4 Thuys is going on a sports tour to London. He has R5 000,00 spending money.

1.4.1 If the exchange rate of Pounds to Rands is $\text{£}1 = \text{R}15,07$, calculate how many pounds Thuys will have to spend. (2)

1.4.2 For the last part of their tour they will be going to France, where they will need Euros.

If 1 Pound = 1,16 Euros calculate how many Euros Thuys will have if he exchanges 100 Pounds. (2)

1.5 A cubic storage container has a capacity of 125 m^3 .

1.5.1 Convert 125 m^3 to cm^3 . (3)

1.5.2 Calculate the maximum number of smaller cubic boxes, each with a volume of $512 000 \text{ cm}^3$, that will be able to fit into the storage container. (3)

1.6 Increase R2 545 by 105%. (3)

1.7 On a game show, if a contestant chooses a box filled with cash, they get to keep the cash. There are 9 boxes to choose from, but only 1 box contains cash. Each contestant gets two chances to choose a box.

1.7.1 What is the probability, in fractional form, that the first box chosen contains the cash? (2)

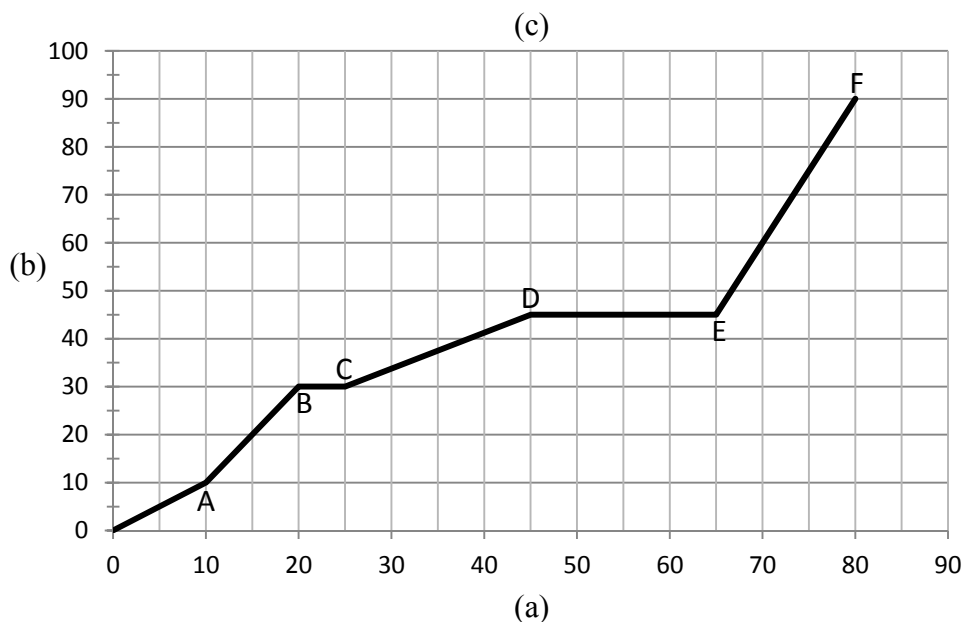
1.7.2 The contestant's first choice is wrong. The box is empty and does not get replaced. Determine the probability, in decimal form, that the next box chosen will contain the cash. (2)

1.8 The scale of a map is 1 : 250 000. Calculate the map distance, in cm, if the actual distance is 15 km. Show all working. (3)
[35]

QUESTION 2

2.1 Tracey and Michael are going to a rock concert at a stadium which is 90 km from their house. The concert starts at 20h00. They want to stop along the way to eat dinner, and so they leave their house at 6 p.m.

The graph below shows their journey.



2.1.1 Complete the labels for (a), (b) and (c) which represent a suitable heading for the graph and labels for the horizontal and vertical axes, in the **Answer Booklet** provided. (3)

2.1.2 Determine the distance they had travelled after exactly 20 minutes. (1)

2.1.3 During which part of their journey were they travelling the fastest?

- Part 1 Between A and B
 - Part 2 Between B and C
 - Part 3 Between C and D
 - Part 4 Between D and E
 - Part 5 Between E and F
- (1)

2.1.4 Describe what might be happening between D and E. (1)

2.1.5 They stopped twice along their journey. Determine the time spent at the first stop. (1)

2.1.6 Calculate the average speed, in km/h, at which they were travelling between C and D.

$$Speed = Distance \div Time \tag{5}$$

2.1.7 At what time did Tracey and Michael arrive at the concert? (2)

2.2 *Papa-Q*, a food vendor at the concert, offered the following meal options at the concert:

Option A	Burger and Chips Coke/Fanta/Water Bar-one/Aero	R35
Option B	Pizza Coke/Fanta/Water Ice-cream	R25

2.2.1 *Papa-Q* sold a total of 238 Option A meals and 316 Option B meals at the concert.
Calculate the total amount he received from his sales. (3)

2.2.2 There was a total of 38 233 meals sold by all the food vendors at the concert. Calculate what percentage of these meals was purchased from *Papa-Q*. (2)

2.3 The equations representing *Papa-Q*'s actual costs for the meals can be written as:

$$\text{Cost of Option A} = R3\ 876 + R9,50 \times \text{No. of meals}$$

$$\text{Cost of Option B} = R2\ 106 + R7,00 \times \text{No. of meals}$$

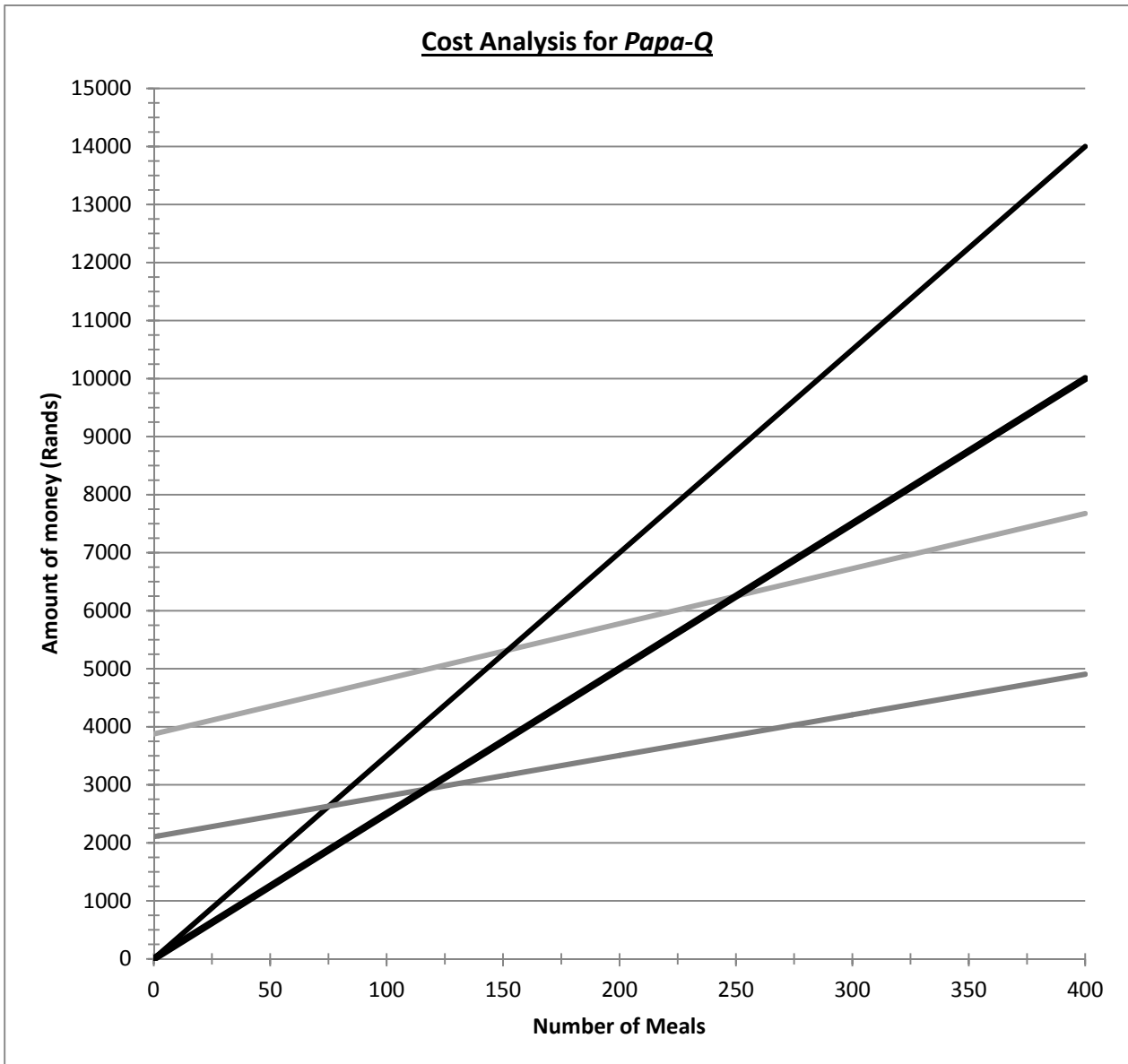
2.3.1 Write down the two equations that represent the income received from the sale of each of *Papa-Q*'s meal options. (3)

2.3.2 Use the equations to calculate the missing values, labelled 'A' to 'D', in the table below.

	No. of Meals	0	50	100	150	200	238	300	316
Option A	Cost	R3 876	A	R4 826	R5 301	R5 776	R6 137	R6 726	R6 878
	Income	R0	R1 750	R3 500	R8 330	R7 000	B	R10 500	R11 060
Option B	Cost	R2 106	R2 456	C	R3 156	R3 506	R3 772	R4 206	R4 318
	Income	R0	R1 250	R2 500	R3 750	D	R5 950	R7 500	R7 900

(4)

2.4 The graphs below represent the cost of making each meal and the income received from the sale of each of the meals.



2.4.1 In the **Answer Booklet** provided, label each graph using the headings below:

- Option A: Cost
- Option B: Cost
- Option A: Income
- Option B: Income

(4)

2.4.2 Each meal option has its own break-even point. In the **Answer Booklet** provided, label **one** of these points clearly on the graph with the letter 'A' **and** then estimate, by reading from the graph, the number of meals that had to be sold in order for *Papa-Q* to break-even for that meal option.

(3)

[33]

QUESTION 3

Ashley is given a full size gumball machine and decides to use it to make some extra money.

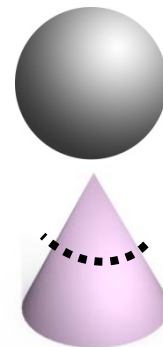


3.1 According to the 'eHow' website a well-placed gumball machine can generate between \$30 and \$40 per month in income.

<http://www.ehow.com/way_5172340_can-start-gumball-machine-business.html>

If the exchange rate is R1,00 = \$0,12, calculate what Ashley's income will be in rands, if she makes \$35 per month. (2)

3.2 Ashley's gumball machine is made up of two shapes; namely, a sphere and a truncated (cut off) cone. See sketch alongside.



The sphere contains the gumballs, while the cone retains the money.

The circumference of the sphere is 140 cm.

3.2.1 Calculate the diameter of the sphere.

$$Diameter = Circumference \div \pi \quad \text{Using } \pi = 3,14 \quad (2)$$

3.2.2 State the radius of the sphere. (1)

3.2.3 Calculate the volume of the sphere, correct to one decimal place.

$$Volume\ of\ Sphere = \frac{4}{3} \pi r^3 \quad \text{Using } \pi = 3,14 \quad (3)$$

3.3 A gumball is also a sphere. The radius of one gumball is 1,5 cm. Calculate the maximum number of gumballs the gumball machine can hold.

$$Volume\ of\ Sphere = \frac{4}{3} \pi r^3 \quad \text{Using } \pi = 3,14 \quad (5)$$

3.4 Ashley can buy packets of gumballs at a cost of R34,95 per packet. Each packet has 150 gumballs in it.

3.4.1 Calculate, approximately, how much it will cost Ashley to fill her gumball machine. (3)

3.4.2 If the average income from the gumball machine is R300 per month, calculate after how many months Ashley will begin to make a profit. (2)

[18]

QUESTION 4

Refer to **Annexure A** which shows a floor plan of City View Shopping Centre.

- 4.1 Refer to the floor plan when answering the questions below.
 - 4.1.1 Give the grid reference for the lifts. (1)
 - 4.1.2 Which store can be found in F9? (1)
 - 4.1.3 If you are standing outside *Reggies* (F6) with the escalator directly in front of you, which store lies at a bearing of 315°? (2)
 - 4.1.4 You are in store G51 (*Clicks*). Store G01 (*Game*) is directly South of you. Name a store that lies to the North of you. (1)
- 4.2 *Game* is the biggest store in this mall, with a length of 135 m and a breadth of 90 m.
 - 4.2.1 Calculate the perimeter of this store. (2)
 - 4.2.2 Calculate the total floor area of this store. (2)
- 4.3 Tshepo needs a new fridge. *Game* is selling one for R3 299 as shown in the advert below.

Since Tshepo does not have the cash required to purchase the fridge, he decides to buy the fridge on hire purchase at 22,1% per annum simple interest over 24 months.



- 4.3.1 Tshepo pays a deposit which is 10% of the cash price. Calculate his deposit amount. (2)
- 4.3.2 Calculate Tshepo's loan amount. (2)

- 4.3.3 Determine the total amount that Tshepo will end up paying for the fridge by making use of the formula below.

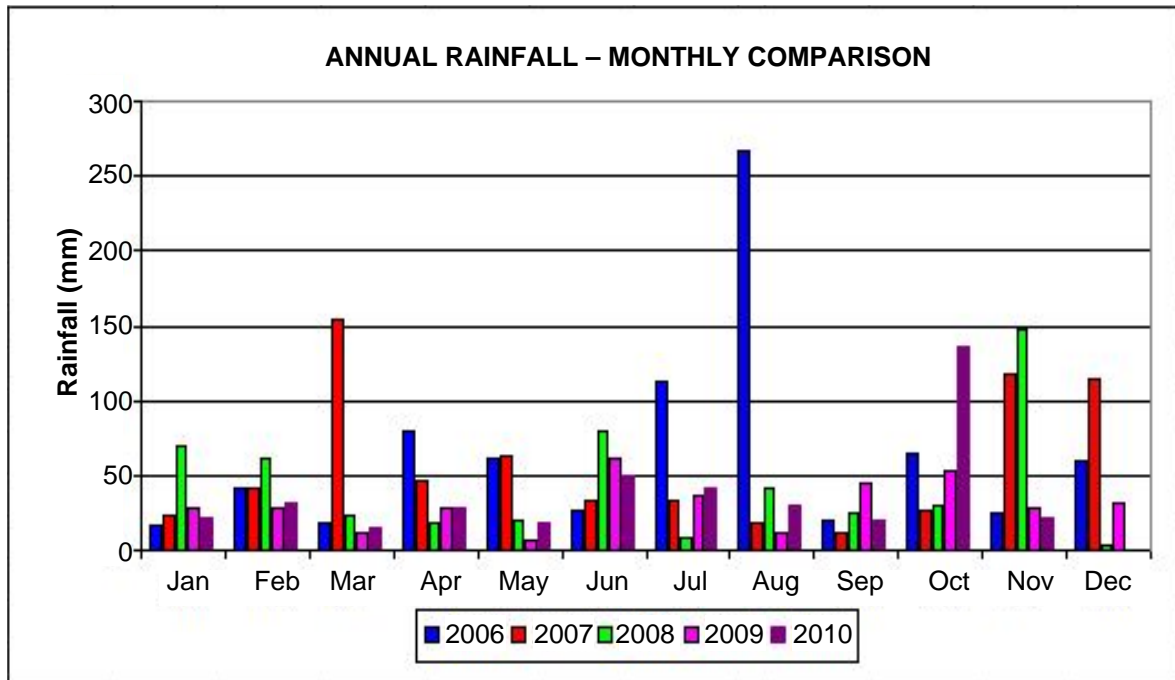
$$A = P(1 + i.n) \quad \text{Where: } A = \text{Final (Accumulated amount)}$$
$$P = \text{Principal amount}$$
$$i = \text{interest rate per year}$$
$$n = \text{period in years} \quad (5)$$

- 4.3.4 Tshepo needs to pay off his loan, which excludes his deposit, in equal monthly instalments. Calculate how much each instalment would be. (2)

[20]

QUESTION 5

Below is a graph and table showing the annual rainfall for Mossel Bay (Heiderand) for the period 2006 to 2010. Refer to it when answering the questions below.



Year	Total Monthly Rain (mm)				
	2006	2007	2008	2009	2010
Jan	17	23	70	29	22
Feb	42	41	62	28	31
Mar	18	154	24	11	15
Apr	79	46	18	29	28
May	62	63	20	7	18
Jun	26	33	80	61	49
Jul	112	33	8	37	41
Aug	267	18	41	11	30
Sep	20	12	25	44	20
Oct	65	27	30	53	136
Nov	25	117	147	28	22
Dec	60	114	4	31	0
Total	793	681	529	369	412

- 5.1 Identify which year had the highest annual rainfall. (1)
- 5.2 During which year and month was the lowest rainfall recorded? (2)
- 5.3 Determine which month had a rainfall of less than 50 mm every year. (2)
- 5.4 5.4.1 Calculate the mean monthly rainfall for 2010. (3)
- 5.4.2 Determine the value of the outlier in 2010 that affected the mean calculation. (2)

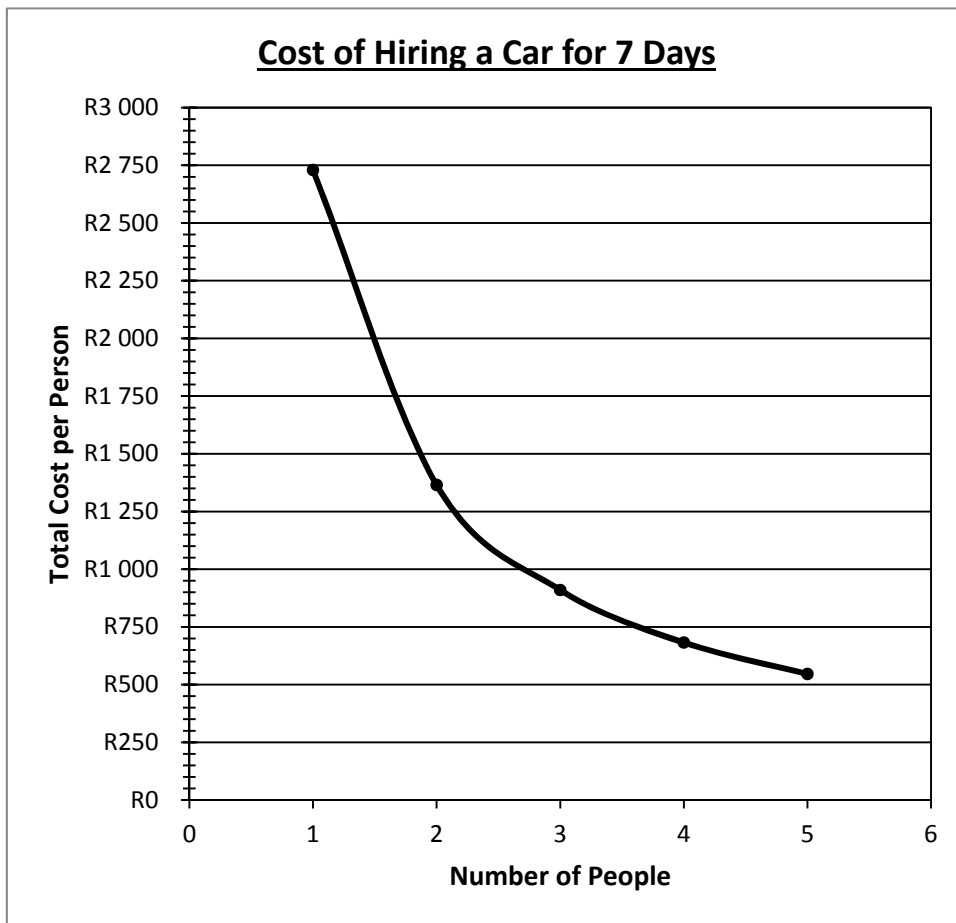
- 5.5 Calculate, showing all working, the median rainfall for 2010. (3)
- 5.6 Identify the modal rainfall for 2010. (2)
- 5.7 Calculate, showing all working, the range of the monthly rainfall for 2010. (2)
- 5.8 Calculate, showing all working, the inter-quartile range for 2010. (5)
- 5.9 The table below shows the average daily hours of sunlight per month for Cape Town.

MONTH	AVERAGE SUNLIGHT (Hours)
January	11
February	10
March	9
April	8
May	6
June	6
July	6
August	7
September	8
October	9
November	10
December	11

[<http://www.sa-villas.com/weather_in_cape_town.html>]

- 5.9.1 Use the grid provided in the **Answer Booklet**, to draw a **line graph** representing the information shown in the table above. (7)
- 5.9.2 During which months does Cape Town experience the longest days, i.e. the most number of hours of sunlight? (2)
- 5.9.3 If you were to visit Cape Town in June, how many hours of sunlight could you expect to have? (1)
- 5.9.4 If there is sunlight from 9h47 until 16h47, which month is it likely to be? (2)
- 5.9.5 On 5 December 2012, the sun rose at 05:28 a.m. and set again at 7:46 p.m. that same day. Calculate the length of time (in hours and minutes) that the sun was shining that day. (4)

5.10 The graph below shows the cost of hiring a car in Cape Town for 7 days.



Refer to the graph above in order to answer the following questions.

- 5.10.1 If only one person paid for the rental of the car, how much would that person pay? (2)
- 5.10.2 If 5 people shared the cost of the car rental, how much would each person pay? (2)
- 5.10.3 How many people would be sharing the cost of the rental if each person paid R910? (2)

[44]

Total: 150 marks