

# Platinum

## Mathematical Literacy

Grade

**11**

**Control Test Book**

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## QUESTION 1

Sabrina is interested in fashion design and has created a range of shirts for men. She is promoting her shirts at various fashion outlets and two have agreed to take some stock on consignment. This means that they only pay Sabrina when the stock is sold.

The two fashion outlets that have agreed to sell her stock are Suave Shirts and Macho for Men.

Sabrina has given Macho for Men a set of casual cotton shirts and Suave Shirts a set of smart silk shirts.

Smart shirts cost R120 to make and are sold by the outlet for R280.

Casual shirts cost R75 to make and are sold by the outlet for R190.

The outlets each ask for 20% of the sale price when a shirt is sold.

- 1.1 Calculate the profit on each type of shirt **for Sabrina**. (4)
- 1.2 Express the profit for each type of shirt as a percentage of the cost of making the shirt. (2)
- 1.3 Which type of shirt is more profitable to make? Give a reason for your choice. (2)
- 1.4 How much profit will **the outlets** earn if 50 casual shirts and 30 smart shirts are sold? (3)

Sabrina uses two kinds of dye for her smart shirts. In order to get the right colour, she has to have twice as much blue dye as green dye. She mixes the dye in 1,2 litre containers.

- 1.5 How much blue dye will be needed for 1,2 litres of mixture? (Hint: let the amount of (3)
- 1.6 The dye costs a total of R40 per 1,2 litres, and she is able to dye 20 shirts using the mixture. What percentage of the total cost of making a smart shirt is spent on dye? (3)
- 1.7 If the amount of dye used in the mixture is increased by 10% and the cost of the dye also increases by 10%, then what percentage of the total cost will be spent on dye? (3)

[20]

## QUESTION 2

Dumi is studying her budget for the past two months, as she has kept track of the money she spent on groceries each week. The amounts are shown in the following table:

Month	1				2			
Week	1	2	3	4	5	6	7	8
Amount spent	R112	R120	R116	R152	R114	R118	R123	R140

- 2.1 What is the median amount of money spent? (3)
- 2.2 What is the mean amount of money spent? (3)

- 2.3 What is the probability that she spent more than R130 on a week picked at random? (3)
- 2.4 Draw a graph of the amount of money spent over time. (3)
- 2.5 Briefly discuss any trends or patterns that you can see in your graph. When is the most money spent each month? (2)
- 2.6 In which **month** did Dumi spend the most money? Give the amount spent. (1)
- 2.7 How much money would you expect Dumi to spend next month? (3)
- 2.8 Approximately how much do you think Dumi spends each year (12 months)? (2)

[20]

### QUESTION 3

Shabir is a busy businessman and has decided to start exercising. He starts with the following workout programme once a week:

Jogging: 20 minutes

Skipping: 5 minutes

Punching bag: 3 sets of 2 minutes with 80 seconds rest after each set.

- 3.1 How long is his workout? (3)
- 3.2 What proportion of his workout is devoted to skipping? (2)
- 3.3 Draw a stacked bar graph with a single bar representing the breakdown of his workout (by minutes, not percentage). (5)
- 3.4 Shabir decides to measure his fitness by counting his heartbeats. He counts 9 beats in 10 seconds. What is his heart rate in beats per minute? (2)
- 3.5 How many times does Shabir's heart beat each second if his heart rate is 70 beats per minute? (2)
- 3.6 Shabir has calculated that he has only 6,5% body fat. If Shabir weighs 70 kg, then how many kilograms of fat are there in his body? (2)
- 3.7 Shabir has decided to try to do at least 4 hours of exercise each week. How many times should he do his workout? (2)
- 3.8 Refer to your answer for question 3.7. Do you think this will be practical for Shabir? Advise Shabir on his workout programme. (2)

[20]

[TOTAL: 60 marks]

## QUESTION 1

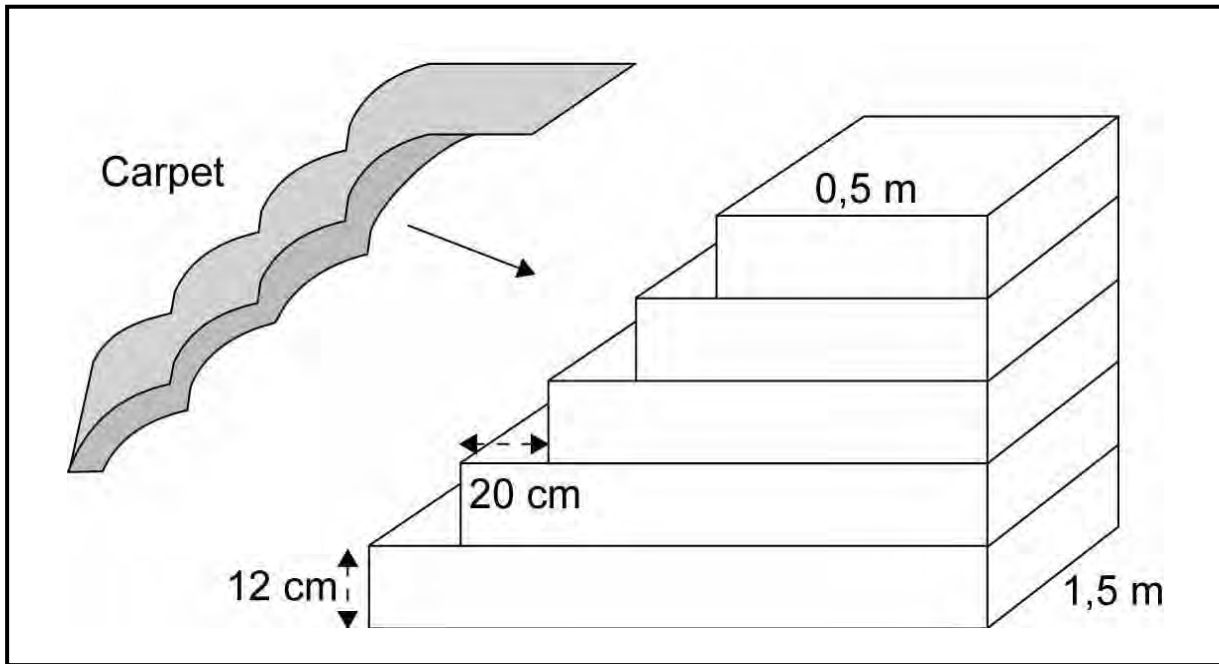
Your friend Oswald has started a small business that offers low cost loans. He borrows money at an interest rate of 5% p.a. (per annum) from England and lends the money to South Africans, charging interest at 8% p.a.

- 1.1 Oswald borrows R10 000 from England. How much interest (in rands) must he pay at the end of the year? (2)
- 1.2 If Oswald lends R10 000 in South Africa, how much interest would be paid to him? (2)
- 1.3 How much profit would Oswald make for the year? (1)
- 1.4 At the start of the year, the exchange rate was R15 = £1 (note that £ is the symbol for pounds). How many pounds would Oswald have borrowed in order to have R10 000? (2)
- 1.5 At the end of the year, an hour before Oswald repaid the English loan, the exchange rate changed to R17,50 = £1. How many rands would he now need to repay his debt? (3)
- 1.6 How many rands would be required to pay the interest on the loan? (3)
- 1.7 When the exchange rate changed, did the rand appreciate or depreciate? (1)
- 1.8 Which would be better for Oswald: a stronger rand at the end of the year or a weaker rand at the end of the year? (1)
- 1.9 Assume that the exchange rate remains at 15 : 1. There is also a flat transaction fee of R50 each time he wants to convert his money from one currency to another. How much money would Oswald have to borrow in order to make a profit of R1 000? (5)

[20]

## QUESTION 2

Tumi works in the interior design industry and is designing and building a staircase. Each step is a stone slab 12 cm high and has 20 cm of space to stand on. There are five steps in the staircase as shown below:



- 2.1 How tall is the staircase? (1)
- 2.2 If the top slab is 0,5 m long, how long is the bottom slab? (3)
- 2.3 How long is the median slab? (3)
- 2.4 What is the volume of the staircase (that is, how much stone is used)? (6)
- 2.5 When the staircase is installed in the house, it will be carpeted. The carpet will run down the stairs in one continuous piece, covering all of the walking area. How much carpet (area) will be needed? (4)

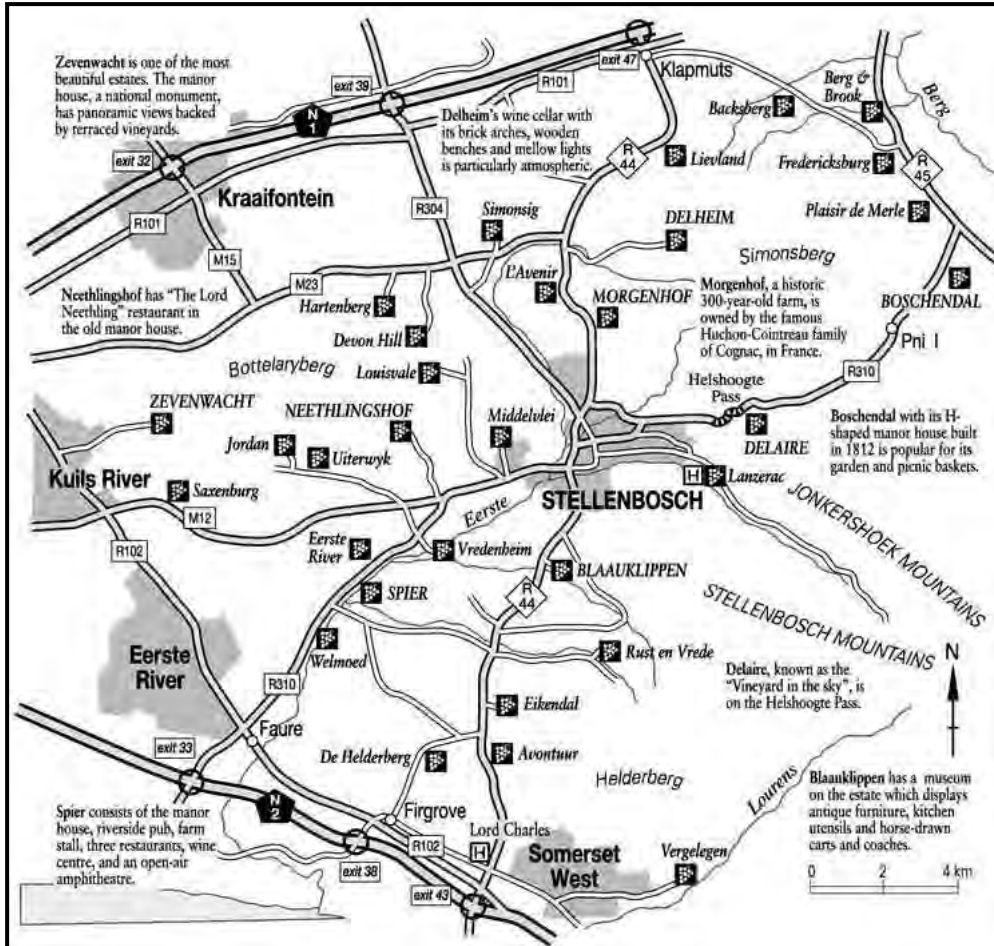
Tumi is also designing a wooden table. The table is to have a circular surface 6 cm thick with a radius of 0,6 m and rectangular legs 1,2 m tall with a square base of 8 cm by 8 cm. The area of a circle is:  $A = \pi r^2$  and the volume of a cylinder is given by:  $V = \pi r^2 h$ .

- 2.6 Calculate the volume of wood required to build the table. Give your answer in  $\text{cm}^3$ . (4)
- 2.7 What will the mass (in kg) of the table be, if  $1 \text{ cm}^3$  of wood weighs 0,4 g? (3)
- 2.8 What volume of wood in  $\text{m}^3$  would have a mass of 1 000 kg? (3)
- 2.9 If a table takes 28 minutes to assemble, how many tables could be built in two and a half hours? (3)

[30]

### QUESTION 3

Refer to the map of the Stellenbosch Wine Route below.



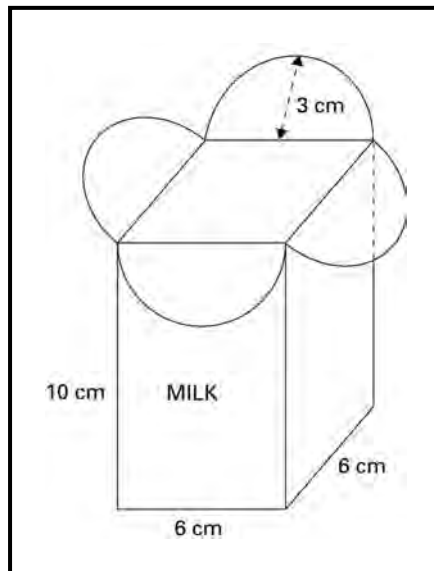
- 3.1 If you were at Spier, in what direction would Zevenwacht lie? (1)
- 3.2 What is the distance between Morgenhof and Neethlingshof as measured on the map? (2)
- 3.3 Complete the following using the scale of the map: 1 cm = ... km. (3)
- 3.4 Use your answers to questions 3.2 and 3.3 to determine the distance (in km) between Morgenhof and Neethlingshof. Round off your answer to one decimal place. (1)
- 3.5 If a plane flies at 185 km/h, how long would it take to fly from Morgenhof to Neethlingshof? (3)
- 3.6 How big is the area (on the ground) enclosed by the M15, the M23, the R304 and the R101 near Kraaifontein near the top left of the map? (4)
- 3.7 If petrol costs R7 per litre and you use 6,3 litres per 100 km, how much would it cost you (for petrol) to drive from exit 32 to exit 39 on the N1? (4)
- 3.8 If the names of all the vineyards shown on the map (grape signs) were put in a hat, what is the probability of picking a vineyard on the M23? (2)

[20]

[TOTAL: 70 marks]

## QUESTION 1

You are working for a company that designs boxes, bottles and other containers. You are currently working on a design for a milk carton as shown below.



The base is a square, 6 cm by 6 cm. The height of the carton is 10 cm. Four overlapping semi-circular flaps seal the top of the carton, each with a radius of 3 cm.

The area of a circle is:  $A = \pi r^2$ .

- 1.1 Find the volume of each milk carton in  $\text{cm}^3$ . Use the formula  $V = l \times b \times h$ . (2)
- 1.2 Determine how much cardboard (the area) is needed to make a single milk carton. (5)
- 1.3 How many litres of milk can each carton hold? (2)
- 1.4 What will it cost to fill 200 cartons with milk, if milk costs R1 200 per kilolitre? Assume that you can buy exactly as much milk as is needed (you don't have to purchase a whole kilolitre if you only need 10 litres, for example). (4)

A dairy truck has a cylindrical tank that is used to transport milk. The tank has a radius of 1,5 m and a length of 3 m.

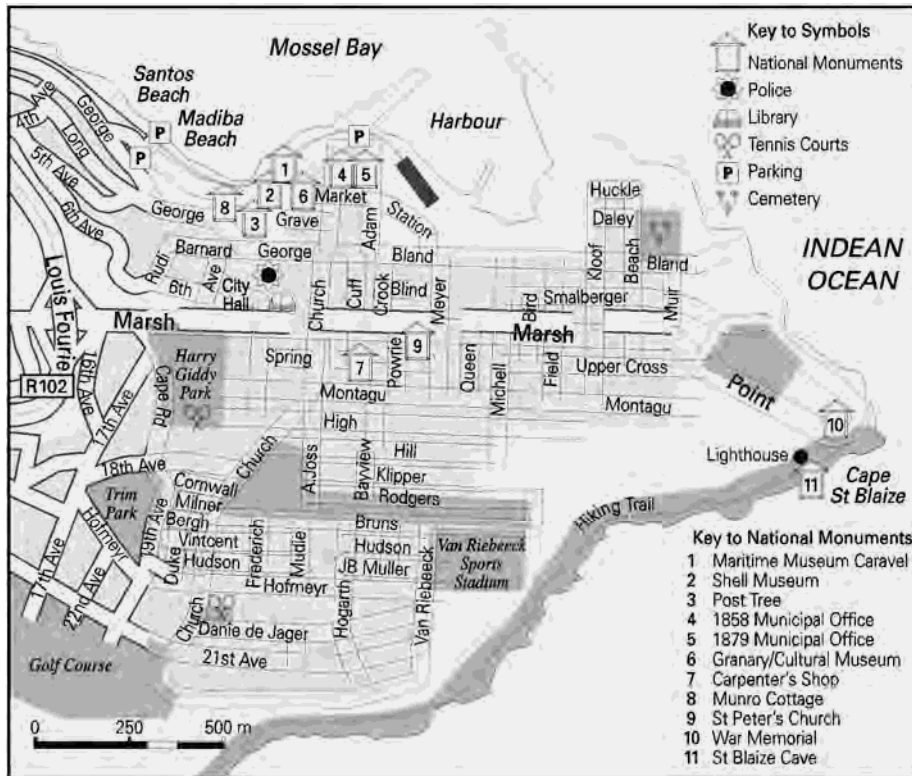
- 1.5 The volume of the tank can be calculated using the formula:  $V = \pi r^2 h$ , where  $r$  is the radius and  $h$  is the height (or in this case, length). Use this formula to determine the capacity of the tank in litres. (5)
- 1.6 How many milk cartons can be filled from one tank? (2)

[20]



## QUESTION 2

Examine the map of Mossel Bay central business area and answer the questions that follow:



- 2.1 How many national monuments are there on the map? (1)
- 2.2 Using the scale provided on the map, determine the length (in km) of Marsh Street. (Marsh Street starts at the Louis Fourie intersection and ends at Muir Street.) (4)
- 2.3 If you were standing in Harry Giddy Park, in what direction would you have to turn in order to be facing Van Riebeeck Sports Stadium? (1)
- 2.4 Your friend, Martin, is on Montagu Street outside the Carpenter's Shop (national monument number 7). He needs to get to the library and has asked you for directions. Clearly direct Martin from his current location to the library. Use compass directions as well as relevant landmarks and street names to describe the route. (4)
- 2.5 After successfully finding his way to the library, Martin decides to take a road trip. His car uses 7,2 litres of petrol per 100 km travelled. If petrol costs R7 per litre, how much will Martin spend on petrol if he travels 480 km in total? (4)

Martin travels quite often and some of the towns he has visited more than once are shown below:

Town	Number of times visited
Springbok	3
Durban	5
Pretoria	3
Johannesburg	7
Hermanus	2

- 2.6 Draw a bar graph based on the table above. Write the names of the towns on the horizontal (x) axis. (4)
- 2.7 If you had randomly decided to go with Martin on one of the visits above, what is the probability that you would have gone to Hermanus? (2)

[20]

### QUESTION 3

Botimelo took a loan from Budget Bank some time ago. Every month, he pays money into the loan account and receives a statement. February's statement is shown below:

<b>Budget Bank</b> We take less of your money than other banks		
Mr Botimelo Sipeng		Loan account number: 34 527
Date	Description	Amount
1/2/06	Balance	2 368,52
28/2/06	Interest	35,53
28/2/06	Instalment	(300,00)
1/3/06	Balance	2 104,05

- 3.1 How much does Botimelo pay each month? (1)
- 3.2 What percentage of the monthly balance is added as interest each month? (Round off to 1 decimal place, for example, 3,2%.) (3)
- 3.3 Based on your answer to question 3.2, what is the **annual** interest rate on the account? (2)
- 3.4 Approximately how long will it take to pay off the loan? (2)

Botimelo recently found a better job, where he works hard and earns more money than before. He was able to quickly pay off his loan and is now thinking about saving money for the future. His financial situation is as follows:

Salary: R8 200 per month

Deductions: 18% PAYE tax (deducted from salary every month).

Expenses:

Rent: R1 800 per month

Other living expenses: R430 per week.

- 3.5 How much money will Botimelo have left each month after tax and after paying his expenses? (4)
- 3.6 How long would it take Botimelo to save R20 000, assuming that he saves all of his remaining money each month? (2)

Botimelo has been saving money for a while and is now excited about the stock market. He has decided to buy some shares in SAB (South African Breweries) because everybody he knows likes beer.

The share price of SAB is R142,02 per share.

When buying or selling shares, there is a transaction fee of R5 plus 0,2% of the transaction amount.

3.7 Botimelo wants to buy 50 shares in SAB. How much will it cost him to buy the shares, including transaction fees? (5)

Since Botimelo bought his shares, the share price for SAB has gone up to R202,53 per share.

3.8 By what percentage has the price of a SAB share gone up? (3)

3.9 What are Botimelo's 50 shares now worth? (2)

3.10 If Botimelo decides to sell all of his shares, how much profit will he have made? (Remember to take transaction costs for buying **and** selling into account.) (4)

3.11 If Botimelo wanted to have approximately R1 000 invested in SAB shares, how many shares would he have to buy? (Use the new share price of R202,53.) (2)

**[30]**

**[TOTAL: 70 marks]**

**QUESTION 1**

Your friend, Shanti, is moving into a new flat and is overwhelmed by all the things she has to do, now that she will be living alone. One of the things she has to do is to buy furniture. She sees an advert that offers the following:

**BUY A SLEEPER COUCH FOR R2 800!**

Take advantage of our excellent terms and pay only R262 per month  
(R300 deposit over 12 months).

- 1.1 Shanti thinks that R262 per month sounds like a very good deal. If she takes this option, how much will she pay for the couch **in total**? (3)
- 1.2 How much of the amount is interest? (2)
- 1.3 What percentage of the normal price is added on as interest if you pay the couch off? (2)
- 1.4 Another option available is to import a similar couch from the USA. The couch costs \$320 and the exchange rate is R7 : \$1. In order to import the couch, you would also have to pay freight of R460.
- a) What would it cost to buy the couch from the USA? (3)
- b) Assuming that Shanti decides to pay cash. Which option is cheaper (the local couch or the couch from the USA) and by how much? (2)

Shanti has also realised that she will have to pay for electricity. The flat has an electricity meter. There are two ways in which electricity costs are calculated, based on whether your electricity use qualifies you as a high or low consumption user.

High consumption: you pay 35 cents per unit.

Low consumption: you pay 40 cents per units, but you get 30 free units.

- 1.5 Complete the following table:

Units used	0	100	200	300	400	500
Cost under high consumption	0	R35	R70	(a)	R140	R175
Cost under low consumption	0	R28	(b)	R108	R148	R188

(2)

- 1.6 Draw a graph for high and low consumption costs based on the table in question 1.5. (4)
- 1.7 Use the table and your graph to **estimate** how many units would cost the same for both the high and low consumption rates. (2)

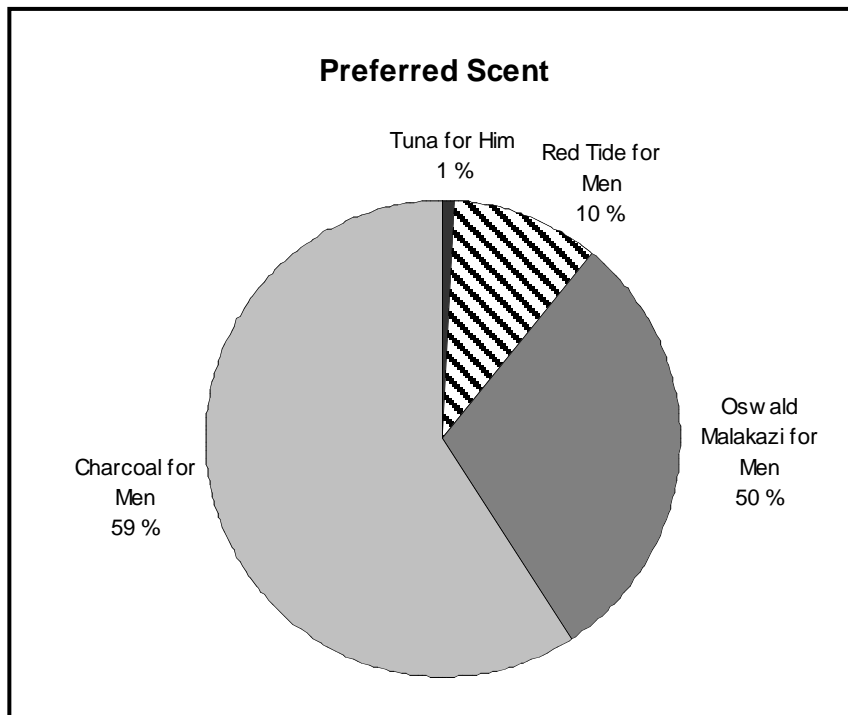
[20]

## QUESTION 2

You work for a perfume company that produces a variety of different men's colognes. Your job is to do market research to see which brands are the most popular. 360 people were asked to smell each cologne and to state which one they preferred. The people surveyed range in age from 16 to 50 years old. The results of the survey are shown in the following table:

Fragrance name	Number of people who liked the cologne
Red Tide for Men	3
Tuna for Him	36
Oswald Malakazi for Men	108
Charcoal for Men	213

- 2.1 What percentage of the people surveyed chose Oswald Malakazi for Men? (2)
- 2.2 Your co-workers have tried to draw a pie chart based on the results of your survey. Unfortunately, they made two mistakes. You must explain these two mistakes to your co-workers and tell them how to correct the mistakes.



(6)

You decide to conduct more detailed research on Charcoal for Men. You pick 16 people out of the group of 213 and compare their ages. The data are shown below:

Ages							
20	25	47	26	32	40	43	37
28	23	27	29	31	22	24	42

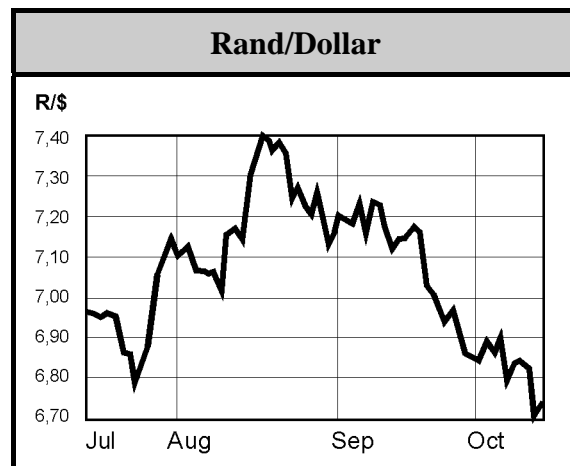
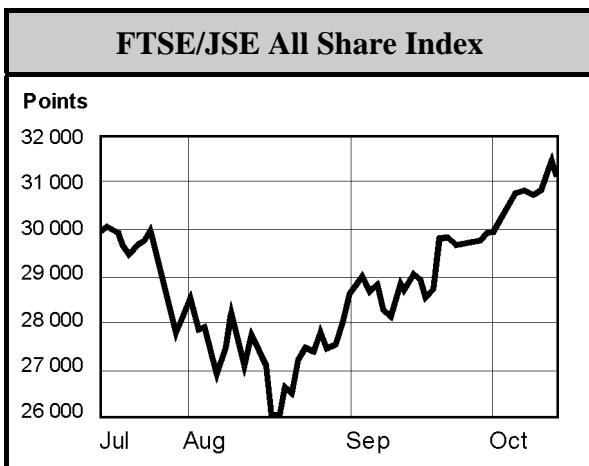
- 2.3 Calculate the median age. (3)
- 2.4 Calculate the mean age. (3)
- 2.5 Calculate the range of the ages. (2)
- 2.6 What percentage of the people in the group were over 30 years old? (2)
- 2.7 Based on your answers, what age group do you think the fragrance appeals to? Justify your answer. (2)

[20]

### QUESTION 3

Your friend, Terry, has asked you to help him make sense of the following financial information taken from the *Sunday Times Business Times*.

Shares	Price (c)	Daily change
Anglo	46 750	2,71% ↓
BHP Billiton	25 428	1,73% ↓
SAB Miller	20 267	1,36% ↓
Richemont	4 522	0,22% ↓
Angloplat	113 000	0,53% ↓



Terry works for SAB Miller. One of the benefits of his job is that he has been given 50 SAB Miller shares.

- 3.1 What is the share price per share in rands? (1)
- 3.2 What are Terry's shares worth, based on the share price shown above? (2)
- 3.3 What was the share price per share in rands yesterday? (3)
- 3.4 If Terry decides to buy R4 000 worth of shares in BHP Billiton, how many shares will he get? (3)

Refer to the graphs, showing the All Share Index (a measure of the overall performance of the South African stock market) and the Rand/Dollar exchange rate.

- 3.5 In which month did the All Share Index do the worst? (1)
- 3.6 Between the beginning of July and the middle of August, the All Share Index fell to its minimum. By what percentage did the All Share Index fall during this period? (4)
- 3.7 When would have been the best time to invest in the All Share Index? Give a reason for your answer. (2)
- 3.8 When was the rand the weakest? (1)
- 3.9 What happened to the dollar between the middle of August and October? (1)
- 3.10 If you were planning to go to the USA for a holiday, when would be the best time to exchange your rands for dollars? Give a reason for your answer. (2)
- 3.11 When would be the best time for an American tourist to exchange his dollars for rands? Give a reason for your answer. (2)
- 3.12 If you had R2 130 and exchanged it for dollars at the beginning of August, how many dollars would you get? (3)
- 3.13 If an American visiting South Africa had \$280 and exchanged his dollars for rands at the beginning of September, how many rands would he receive? (3)
- 3.14 Do you notice any relationship between the two graphs? If so, briefly state what kind of relationship you have noticed. (2)

**[30]**

**[TOTAL: 70 marks]**

**MATHEMATICAL LITERACY**  
**TEST ONE MEMO**

**QUESTION 1**

$$\begin{aligned}
 1.1 \quad \text{Smart shirt profit} &= \text{selling price} - \text{cost of shirt} - \text{commission} \\
 &= R[280 - 120 - (20\% \times 280)] \checkmark \\
 &= R104 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 \text{Casual shirt profit} &= R[190 - 75 - (20\% \times 190)] \checkmark \\
 &= R77 \checkmark \qquad (4)
 \end{aligned}$$

$$1.2 \quad \text{Smart shirt percentage} = \frac{R104}{R120} \times 100 = 86,67\% \checkmark$$

$$\text{Casual shirt percentage} = \frac{R77}{R75} \times 100 = 102,67\% \checkmark \qquad (2)$$

1.3 Casual shirts,  $\checkmark$  because each rand spent on making a casual shirt earns more profit.  $\checkmark$  (2)

1.4 The outlet earns 20% of the selling price.

$$\text{On each smart shirt: } R280 \times 20\% = R56$$

$$\text{On each casual shirt: } R190 \times 20\% = R38$$

$$\begin{aligned}
 \therefore \text{Profit} &= (50 \times R38) + (30 \times R56) \checkmark \checkmark \\
 &= R3\,580 \checkmark \qquad (3)
 \end{aligned}$$



1.5 If green dye =  $x$ , then blue dye =  $2x$ .

$$x + 2x = 1,2 \text{ litres } \checkmark$$

$$3x = 1,2$$

$$x = \frac{1,2}{3} = 0,4 \text{ litres } \checkmark$$

$$\therefore \text{Blue dye} = 2(0,4)$$

$$= 0,8 \text{ litres } \checkmark$$

(3)

1.6 Total cost of smart shirts = R120.

$$\text{Cost of dye per shirt} = \frac{40}{20} = \text{R2 per shirt } \checkmark$$

$$\therefore \text{Percentage} = \frac{\text{R2}}{\text{R120}} \times 100 \checkmark = 1,67\% \checkmark$$

(3)

1.7 Will need 10% more dye at 10% higher cost.

Must spend  $110\% \times 110\%$  original cost.

$$\therefore \text{New cost} = 110\% \times 110\% \times \text{R2 } \checkmark$$

$$= \text{R2,42 } \checkmark$$

$$\text{New percentage} = \frac{\text{R2,42}}{\text{R120}} \times 100$$

$$= 2,02\% \checkmark \quad (\text{Alternative: } 1,67\% \times 110\% \times 110\% = 2,02\%.) \quad (3)$$

[20]

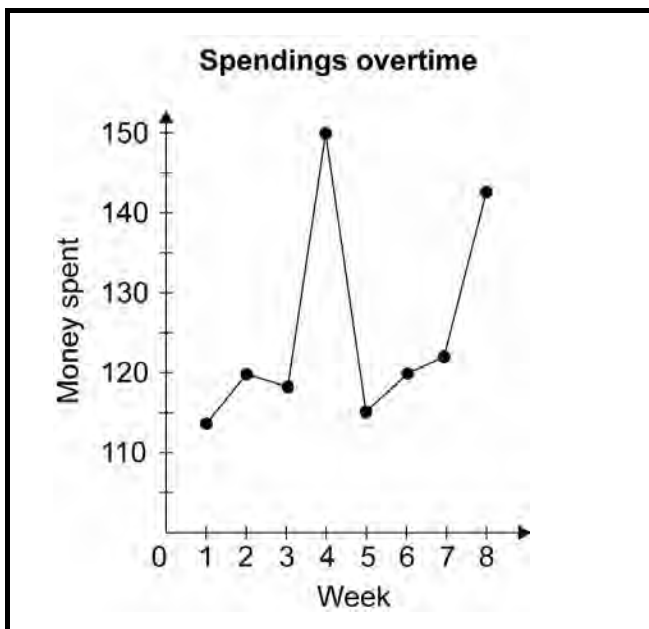
## QUESTION 2

2.1 Median =  $\frac{118+120}{2}$  ✓✓  
= R119 ✓ (3)

2.2 Mean =  $\frac{112+120+116+152+114+118+123+140}{8}$  ✓✓  
=  $\frac{995}{8}$   
= R124,38 ✓ (3)

2.3 Probability =  $\frac{2}{8}$  ✓✓ =  $\frac{1}{4}$  ✓ (3)

2.4



✓✓✓

(3)

2.5 The most money is spent in the last week of each month. ✓✓ This could be linked to a monthly cycle (for example, when salaries are received and monthly bills are paid). (2)

$$2.6 \quad \text{Month 1} = R(112 + 120 + 116 + 152) \\ = R500$$

$$\text{Month 2} = R(114 + 118 + 123 + 140) \\ = R495$$

∴ The most money is spent in Month 1 (R500). ✓ (1)

$$2.7 \quad \text{The average amount spent each month is } \frac{500 + 495}{2} = R497,50 \checkmark$$

If Dumi's habits remain constant, we would expect her to spend, on average, the same amount each month. ✓

We would therefore expect her to spend approximately R497,50 next month. ✓ (3)

$$2.8 \quad \text{For the year, we expect approximately } 12 \times R497,50 \checkmark = R5\,970 \text{ to be spent. } \checkmark \quad (2)$$

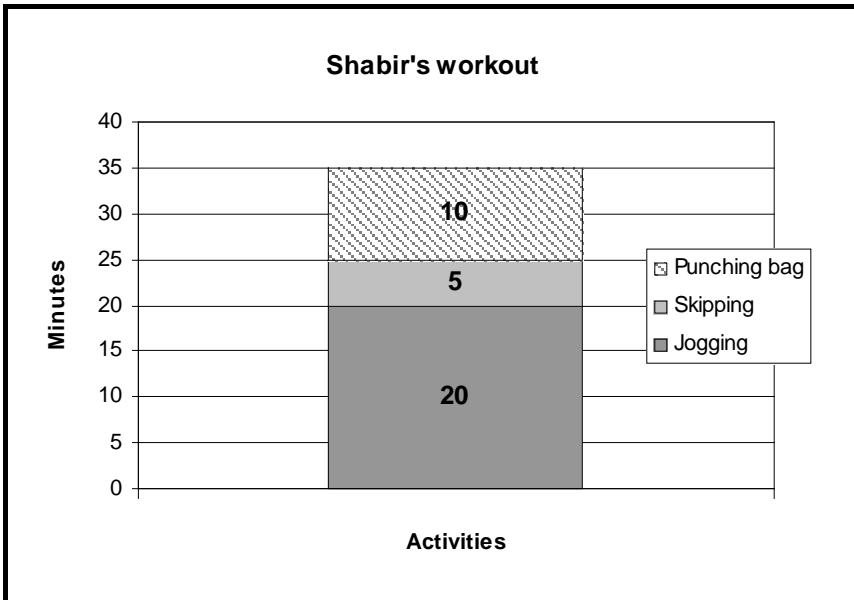
[20]

### QUESTION 3

$$3.1 \quad \text{Workout time} = [20 + 5 + (3 \times 2) \text{ min}] + (3 \times 80 \text{ seconds}) \checkmark \\ = 25 + 6 + 4 \checkmark \quad (240 \text{ seconds} = \frac{240}{60} = 4 \text{ min.}) \\ = 35 \text{ min } \checkmark \quad (3)$$

$$3.2 \quad \text{Skipping} = \frac{5}{35} \checkmark = \frac{1}{7} \checkmark \quad (2)$$

3.3



Title ✓

Axes ✓

Legend ✓

Data ✓✓

(5)

3.4 Beats per minute =  $9 \times 6 \checkmark = 54 \checkmark$

(2)

3.5 Beats per second =  $\frac{72}{60} \checkmark = 1,2 \checkmark$

(2)

3.6 Fat =  $6,5\% \times 70 \text{ kg} \checkmark = 4,55 \text{ kg} \checkmark$

(2)

3.7 4 hours =  $4 \times 60 \text{ minutes} = 240 \text{ minutes}$

$$\frac{240}{35} \checkmark = 6,86$$

∴ Shabir needs 7 workouts per week. ✓

(2)

3.8 As a busy businessman, it may be difficult for Shabir to exercise every day (7 times per week). He should probably do 3 or 4 longer workouts every week. ✓✓

(2)

[20]

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[TOTAL: 60 marks]

MATHEMATICAL LITERACY  
TEST TWO MEMO

## QUESTION 1

$$\begin{aligned} 1.1 \quad \text{Interest owed} &= 5\% \times 10\,000 \checkmark \\ &= R500 \checkmark \end{aligned} \quad (2)$$

$$\begin{aligned} 1.2 \quad \text{Interest received} &= 8\% \times 10\,000 \checkmark \\ &= R800 \checkmark \end{aligned} \quad (2)$$

$$\begin{aligned} 1.3 \quad \text{Profit} &= R(800 - 500) \\ &= R300 \checkmark \end{aligned} \quad (1)$$

$$\begin{aligned} 1.4 \quad \text{Pounds (£)} &= \frac{R10\,000}{R15 \text{ per pound}} \checkmark \\ &= \text{£}666,67 \checkmark \end{aligned} \quad (2)$$

$$\begin{aligned} 1.5 \quad \text{Rands (R)} &= \text{pounds} \times R17,50 \text{ per pound} \checkmark \\ &= \text{£}666,67 \times R17,50 \text{ per pound} \checkmark \\ &= R11\,666,73 \checkmark \end{aligned} \quad (3)$$

$$\begin{aligned} 1.6 \quad \text{Interest owed} &= \text{£}666,67 \times 5\% \\ &= \text{£}33,33 \checkmark \end{aligned}$$

$$\begin{aligned} \text{In rands, interest} &= \text{£}33,33 \times R17,50 \text{ per pound} \checkmark \\ &= R583,28 \checkmark \end{aligned} \quad (3)$$

$$1.7 \quad \text{The rand depreciated.} \checkmark \quad (1)$$

1.8 A stronger rand ✓ (1)

1.9 Each year, Oswald will earn  $(8 - 5)\% = 3\%$  profit on the money he borrows. ✓

Transaction fees = R50 + R50 = R100 (to change pounds to rands when he borrows, and rands back to pounds when he repays.) ✓

∴ Must earn  $R(1\ 000 + 100) = R1\ 100$  ✓

$$3\% \times \text{amount borrowed} = R1\ 100$$

$$\therefore \text{Amount borrowed} = \frac{R1\ 100}{3\%} \checkmark$$

$$= R36\ 666,67 \checkmark \quad (5)$$

[20]

## QUESTION 2

2.1  $5 \times 12 \text{ cm} = 60 \text{ cm}$  ✓ (1)

2.2 Each slab is 0,2 m (20 cm) shorter than the one below it.

Bottom slab will be  $[0,5 + (4 \times 0,2)] \text{ m} = 1,3 \text{ m}$  long. ✓✓✓ (3)

2.3 Median slab is the 3rd slab. ✓

3rd slab will be  $[0,5 + (2 \times 0,2)] \text{ m} = 0,9 \text{ m}$  long. ✓✓ (3)

2.4 Volume = slab 1 + slab 2 + slab 3 + slab 4 + slab 5

$$\text{Slab 1} = (0,5 \times 0,12) \times 1,5 = 0,09 \text{ m}^3 \checkmark$$

$$\text{Slab 2} = [(0,5 + 0,2) \times 0,12] \times 1,5 = 0,126 \text{ m}^3 \checkmark$$

$$\text{Slab 3} = (0,9 \times 0,12) \times 1,5 = 0,162 \text{ m}^3 \checkmark$$

$$\text{Slab 4} = [(0,9 + 0,2) \times 0,12] \times 1,5 = 0,198 \text{ m}^3 \checkmark$$

$$\text{Slab 5} = (1,3 \times 0,12) \times 1,5 = 0,234 \text{ m}^3 \checkmark$$

$$\begin{aligned} \text{Volume} &= 0,09 + 0,126 + 0,162 + 0,198 + 0,234 \\ &= 0,81 \text{ m}^3 \checkmark \end{aligned} \quad (6)$$

$$\begin{aligned} 2.5 \quad \text{Carpet length} &= 4 \times (0,12 + 0,2) + 0,12 + 0,5 \checkmark \checkmark \\ &= 1,9 \text{ m} \checkmark \end{aligned}$$

$$\text{Carpet area} = 1,9 \times 1,5 = 2,85 \text{ m}^2 \checkmark \quad (4)$$

$$\begin{aligned} 2.6 \quad \text{Table} &= \text{circular top} + 4 \text{ legs} \\ &= \pi(60)^2(6) + 4 \times (8 \times 8 \times 120) \checkmark \checkmark \checkmark \quad (\text{Lengths in cm.}) \\ &= 98\,578,40 \text{ cm}^3 \checkmark \end{aligned} \quad (4)$$

$$\begin{aligned} 2.7 \quad 0,4 \text{ g} &= \frac{0,4}{1000} \\ &= 0,0004 \text{ kg} \checkmark \\ \therefore \text{Mass} &= 98\,578,40 \times 0,0004 \checkmark \\ &= 39,43 \text{ kg} \checkmark \end{aligned} \quad (3)$$

$$\begin{aligned} 2.8 \quad 1 \text{ m}^3 &= 100 \text{ cm} \times 100 \text{ cm} \times 100 \text{ cm} \\ &= 1\,000\,000 \text{ cm}^3 \checkmark \\ \frac{1\,000 \text{ kg}}{0,0004} &= 2\,500\,000 \checkmark \\ &= 2,5 \text{ m}^3 \checkmark \end{aligned} \quad (3)$$

$$2.9 \quad 2,5 \text{ hours} = 2,5 \times 60 = 150 \text{ minutes}$$

$$\frac{150}{28} = 5,36 \text{ tables} \checkmark \checkmark$$

$$\therefore \text{Can assemble 5 tables in 2,5 hours.} \checkmark \quad (3)$$

[30]

### QUESTION 3

3.1 North west ✓ (1)

**Note:** Certain printer settings may cause the scale diagrams to print differently. The following solutions for 3.2 to 3.7 are intended as a guide regarding method and mark allocation. The final answers for 3.2 to 3.7 should remain approximately the same, but workings may vary.

3.2 Approximately 3,6 cm ✓✓ (2)

3.3 2,3 cm = 4 km

$$\therefore 1 \text{ cm} = \frac{4}{2,3} \checkmark\checkmark$$

$$\therefore 1 \text{ cm} = 1,74 \text{ km} \checkmark \quad (3)$$

3.4  $3,6 \times 1,74 = 6,3 \text{ km} \checkmark$  (1)

$$3.5 \text{ Time} = \frac{6,3}{185} \checkmark$$

$$= 0,034 \text{ hours} \checkmark$$

$$= \text{Approximately 2 minutes} \checkmark \quad (3)$$

3.6 Approximately 2 cm by 3 cm on the map

$$\text{That is, approximately } (2 \times 1,74) \checkmark \times (3 \times 1,74) \checkmark = 18,17 \text{ km}^2 \checkmark\checkmark \quad (4)$$



3.7 Approximately 3,5 cm on map

$$\text{Distance} = 3,5 \times 1,74$$

$$= 6,09 \text{ km } \checkmark$$

$$\text{Litres} = 6,09 \times \frac{6,3}{100} \checkmark$$

$$= 0,38 \text{ litres } \checkmark$$

$$\text{Cost} = 0,38 \times 7$$

$$= \text{R}2,66 \checkmark$$

(4)

3.8  $\frac{3}{31} \checkmark \checkmark$

(2)

[20]

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[TOTAL: 70 marks]

MATHEMATICAL LITERACY  
TEST THREE MEMO

## QUESTION 1

$$\begin{aligned} 1.1 \quad V &= l \times b \times h \\ &= 6 \times 6 \times 10 \checkmark \\ &= 360 \text{ cm}^3 \checkmark \end{aligned} \quad (2)$$

$$\begin{aligned} 1.2 \quad A &= 4 \text{ rectangles} + 2 \text{ circles} + 1 \text{ square} \\ &= 4(6 \times 10) \checkmark + (2 \times \pi(3)^2) \checkmark \checkmark + (6 \times 6) \checkmark \\ &= 332,55 \text{ cm}^2 \checkmark \end{aligned} \quad (5)$$

$$1.3 \quad \text{Can contain } \frac{360}{1000} \checkmark = 0,36 \text{ litres } \checkmark \quad (2)$$

$$\begin{aligned} 1.4 \quad \text{Milk needed} &= 200 \times 0,36 \text{ litres} \\ &= 72 \text{ litres } \checkmark \end{aligned}$$

$$\begin{aligned} \text{Price per litre} &= \frac{1200}{1000} \\ &= \text{R}1,20 \checkmark \end{aligned}$$

$$\begin{aligned} \therefore \text{Cost} &= 72 \times \text{R}1,20 \checkmark \\ &= \text{R}86,40 \checkmark \end{aligned} \quad (4)$$

$$\begin{aligned}
1.5 \quad V &= \pi r^2 h \\
&= \pi(1\,500)(3\,000) \checkmark\checkmark && \text{(Convert to cm as 1 litre = 1\,000 cm}^3\text{.)} \\
&= 1\,413\,766,94 \text{ cm}^3 \checkmark \\
&= \frac{1\,413\,766,94}{1\,000} \text{ litres } \checkmark \\
&= 14\,137,17 \text{ litres } \checkmark && (5)
\end{aligned}$$

1.6 Each carton requires 0,36 litres

$$\therefore \text{Can fill } \frac{14\,137,17}{0,36} \checkmark = 39\,269,91 = 39\,269 \text{ cartons. } \checkmark$$

*(Learners must know not to round up, as you cannot have a partially filled carton.)* (2)

[20]

## QUESTION 2

2.1 11  $\checkmark$  (1)

2.2 **Note:** Certain printer settings may cause the scale diagrams to print differently. The following solution is intended as a guide regarding method and mark allocation. The final answer should remain the same, but the workings may vary.

From the scale: 3 cm = 500 m  $\checkmark$

$$\therefore 1 \text{ cm} = \frac{500}{3} = 166,67 \text{ m } \checkmark$$

Length of Marsh Street =  $\pm 9,2 \text{ cm } \checkmark$

$$= 9,2 \times 166,67 = \pm 1\,533 \text{ m}$$

$$= \pm 1,53 \text{ km } \checkmark \quad (4)$$

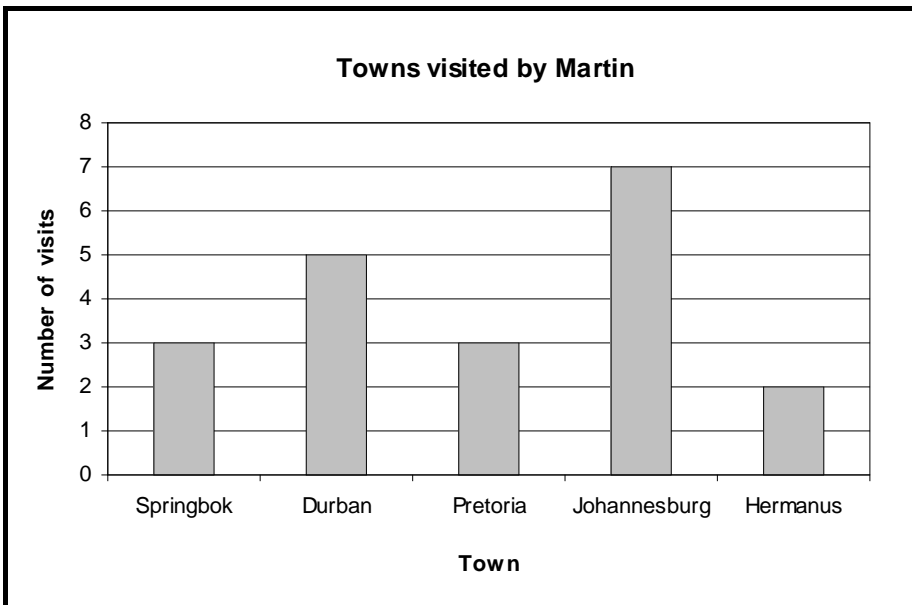
2.3 South east  $\checkmark$  (1)

2.4 Travel west along Montagu Street until you reach an intersection. ✓ Turn right into Church Street and travel north until you reach Marsh Street. ✓ Turn left in Marsh Street and proceed in a westerly direction. ✓ The library will be on your right before the next intersection. ✓ (Max 4 marks; some detail may be omitted.) (4)

2.5 Litres needed =  $\frac{7,2}{100} \times 480$  ✓  
 = 34,56 litres ✓

Cost of petrol = 34,56 litres × R7 ✓  
 = R241,92 ✓ (4)

2.6



✓✓  
 ✓✓

(4)

2.7  $P(\text{Hermanus}) = \frac{2}{3+5+3+7+2}$  ✓  
 =  $\frac{2}{20}$  ✓ (= 10%)

(2)

[20]

### QUESTION 3

3.1 R300 ✓ (1)

3.2 Percentage =  $\frac{35,53}{2378,52} \times 100 \checkmark\checkmark = 1,5\% \checkmark$  (3)

3.3 1,5% added each month, so for the year:

$$\text{Interest} = 12 \times 1,5\% \checkmark = 18\% \checkmark \quad (2)$$

3.4 Interest paid will decrease over time, so we'd be repaying about R280 each month on average.

$$\begin{aligned} \text{Time to repay loan} &= \frac{2104,5}{280} \checkmark \\ &\approx 8 \text{ months } \checkmark \end{aligned} \quad (2)$$

3.5 Salary after tax = R8 200 × (100% – 18%)  
= R8 200 × (82%)  
= R6 724 ✓

$$\text{Total expenses} = R[1\ 800 + (4 \times 430)] = R3\ 520 \checkmark$$

$$\therefore \text{Money left} = R(6\ 724 - 3\ 520) \checkmark = R3\ 204 \checkmark \quad (4)$$

3.6 It would take  $\frac{R20\ 000}{R3\ 204 \text{ per month}} = 6,24 \approx 7 \text{ months. } \checkmark\checkmark$

*(Learners must know to round up to 7 months.)* (2)

3.7 Share cost =  $R142,02 \times 50 = R7\ 101$  ✓

Transaction fee =  $R[5 + (0,2\% \times 7\ 101)]$  ✓  
=  $R19,20$  ✓

Total cost =  $R(7\ 101 + 19,20)$  ✓ =  $R7\ 120,20$  ✓ (5)

3.8 Percentage increase =  $\frac{202,53 - 142,02}{142,02} \times 100$  ✓✓  
=  $42,61\%$  ✓ (3)

3.9 Shares are worth  $50 \times R202,53 = R10\ 126,50$  ✓✓ (2)

3.10 Cost of buying =  $R7\ 120,20$

Cost of selling =  $R[5 + (0,2\% \times 10\ 126,50)]$  ✓  
=  $R25,25$  ✓

Profit =  $R(10\ 126,50 - 7\ 120,20 - 25,25)$  ✓  
=  $R2\ 981,05$  ✓ (4)

3.11 Shares =  $\frac{1\ 000}{202,53}$  ✓ = 4,9 shares

He could only afford 4 shares with R1 000. To have just over R1 000 invested, he would need to buy 5 shares. ✓ (2)

[30]

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[TOTAL: 70 marks]

**MATHEMATICAL LITERACY**  
**TEST FOUR MEMO**

**QUESTION 1**

1.1 Total paid =  $R[300 + (262 \times 12)] \checkmark\checkmark = R3\,444 \checkmark$  (3)

1.2 Interest =  $R(3\,444 - 2\,800) \checkmark = R644 \checkmark$  (2)

1.3 Percentage =  $\frac{R644}{R2\,800} \times 100 \checkmark = 23\% \checkmark$  (2)

1.4 a) Total cost =  $R[460 + (7 \times 320)] \checkmark\checkmark = R2\,700 \checkmark$  (3)

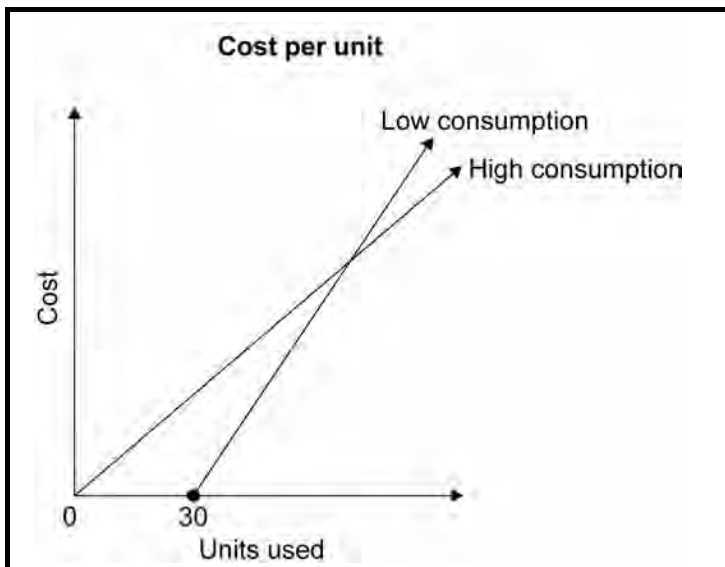
b) It is cheaper to buy the couch from the USA.  $\checkmark$

The USA couch is cheaper by  $R(2\,800 - 2\,700) = R100. \checkmark$  (2)

1.5 a)  $R300 \times 0,35 = R105 \checkmark$

b)  $R[(200 - 30) \times 0,40] = R68 \checkmark$  (2)

1.6



$\checkmark\checkmark$   
 $\checkmark\checkmark$

(4)

1.7 Break even is at 240 units.  $\checkmark\checkmark$  (Any reasonable estimate close to this is acceptable.) (2)

**[20]**

## QUESTION 2

2.1 Percentage =  $\frac{108}{360} \times 100 \checkmark = 30\% \checkmark$  (2)

2.2 Tuna and Red Tide labels have been exchanged. The percentages are with the right slices, but the labels are not. To correct this, swap the labels.  $\checkmark\checkmark\checkmark$

Oswald Malakazi percentage is incorrect. Should be 30%, not 50%.  $\checkmark\checkmark\checkmark$  (6)

2.3 Median =  $\frac{28+29}{2} \checkmark\checkmark$   
= 28,5  $\checkmark$  (3)

2.4 Mean =  $\frac{496}{16} \checkmark\checkmark$   
= 31  $\checkmark$  (3)

2.5 Range =  $47 - 20 \checkmark = 27 \checkmark$  (2)

2.6 6 people over 30, so percentage =  $\frac{6}{16} \times 100 \checkmark$   
= 37,5%  $\checkmark$  (2)

2.7 Mid to late twenties.  $\checkmark$  The average is 31 years old, but because of the large range and few ages above 30, it seems that most of the people were slightly younger than 30.  $\checkmark$  (2)

[20]

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### QUESTION 3

3.1 Share price = R202,67 ✓ (1)

3.2 Value of shares =  $50 \times \text{R}202,67$  ✓  
= R10 133,50 ✓ (2)

3.3 Current price = yesterday's price  $\times (100 - 1,36)\%$   
R202,67 = yesterday's price  $\times 98,64\%$   
 $\therefore$  Yesterday's price =  $\frac{\text{R}202,67}{98,64\%}$  ✓✓  
= R205,46 ✓ (3)

3.4  $\frac{\text{R}4\,000}{\text{R}254,28 \text{ per share}} = 15,73 \text{ shares}$  ✓✓  
He would be able to afford 15 shares. ✓ (*Learners must know to round down.*) (3)

3.5 July ✓ (*Although it reached its minimum in August, it fell by the most in July.*) (1)

3.6 Percentage fall =  $\frac{30\,000 - 26\,000}{30\,000} \times 100$  ✓✓✓  
= 13,33% ✓ (4)

3.7 Mid August when the All Share Index was at its minimum (that is, cheapest to buy). ✓  
When the All Share Index goes up, you will then make the most profit. ✓ (2)

3.8 Mid August. ✓ (*This was when the most rands would be needed to buy one dollar.*) (1)

- 3.9 The dollar got weaker against the rand. ✓ (1)
- 3.10 In October when the rand/dollar rate is lowest. ✓ If you exchanged your rands then, you would get the most dollars, as a dollar would only cost R6,70. ✓  
(The lowest rand/dollar rate means that dollars are cheaper.) (2)
- 3.11 Mid August, when the rand/dollar is highest. ✓ The tourist would get the most rands for each of his or her dollars (R7,40) at this point. ✓ (2)
- 3.12 Dollars =  $\frac{R2\,130}{R7,1 \text{ per dollar}}$  ✓✓  
= \$300 ✓ (3)
- 3.13 Rands = \$280 × R7,20 per dollar ✓✓  
= R2 016 ✓ (3)
- 3.14 Yes, when one goes up, the other goes down. ✓ There appears to be an inverse (or negative) ✓ relationship between the two graphs. (2)

[30]

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[TOTAL: 70 marks]

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