education
Department:
Education
PROVINCE OF KWAZULU-NATAL

ENQUIRIES: MR D.A. SEWLALL DATE: 31 MAY 2016

NATIONAL SENIOR CERTIFICATE: COMMON TEST JUNE 2016: GRADE 12

TO: THE CHIEF INVIGILATOR OF ALL SCHOOLS OFFERING: MATHEMATICAL LITERACY P1

ERRATA

Please take note of the following change:

PAGE	NUMBER	ERROR	CORRECTION
5	2.4 (formula)	$\text{BMI} = \frac{\text{weightin (kg)}}{(\text{heightin (m)})^2}$	$\text{BMI} = \frac{\text{weight in (kg)}}{(\text{height in (m)})^2}$

Kindly ensure that candidates are informed of the Errata.

MS N.V. MCAMBI
DEPUTY MANAGER
PROVINCIAL EXAMINATION ADMINISTRATION

2/6/2016
DATE

KWAZULU-NATAL DEPARTMENT OF EDUCATION
Postal Address: Private Bag X01 • EAST END • 4018 • Republic of South Africa
Physical Address: 72 Stalwart Simelane Street • Malgate Building • Durban • 4000
Tel. +27 31 327 0462 • **Web** www.kzneducation.gov.za

Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

MATHEMATICAL LITERACY P1

COMMON TEST

JUNE 2016

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: **100**

TIME: **2 hours**

N.B. This question paper consists of 10 pages and 1 Answer Sheet.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **FIVE** questions. Answer **ALL** the questions.

2. Answer QUESTION 4.6 on the attached ANSWER SHEET. Write your NAME, SURNAME and CLASS in the spaces provided on the ANSWER SHEET and hand in the ANSWER SHEET with your ANSWER BOOK.

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start **EACH** question on a **NEW** page.

5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

6. **ALL** the calculations must be clearly shown.

7. **ALL** the final answers must be rounded off according to the context, unless stated otherwise.

8. Units of measurement must be indicated where applicable.

9. Write neatly and legibly.

QUESTION 1

Thembisile from Ulundi (KwaZulu Natal) is teaching Numeracy at Anfield Secondary school in London. She is thirty years old. During Easter holidays, Thembisile plans to visit her parents in South Africa for six days. She has to book an aeroplane to South Africa. She comes across adverts of two different airlines with special fares in London Times newspaper.

Advert 1: London to Johannesburg fare £505 including airport taxes return ticket

Advert 2: London to Johannesburg fare £420 excluding airport taxes return ticket

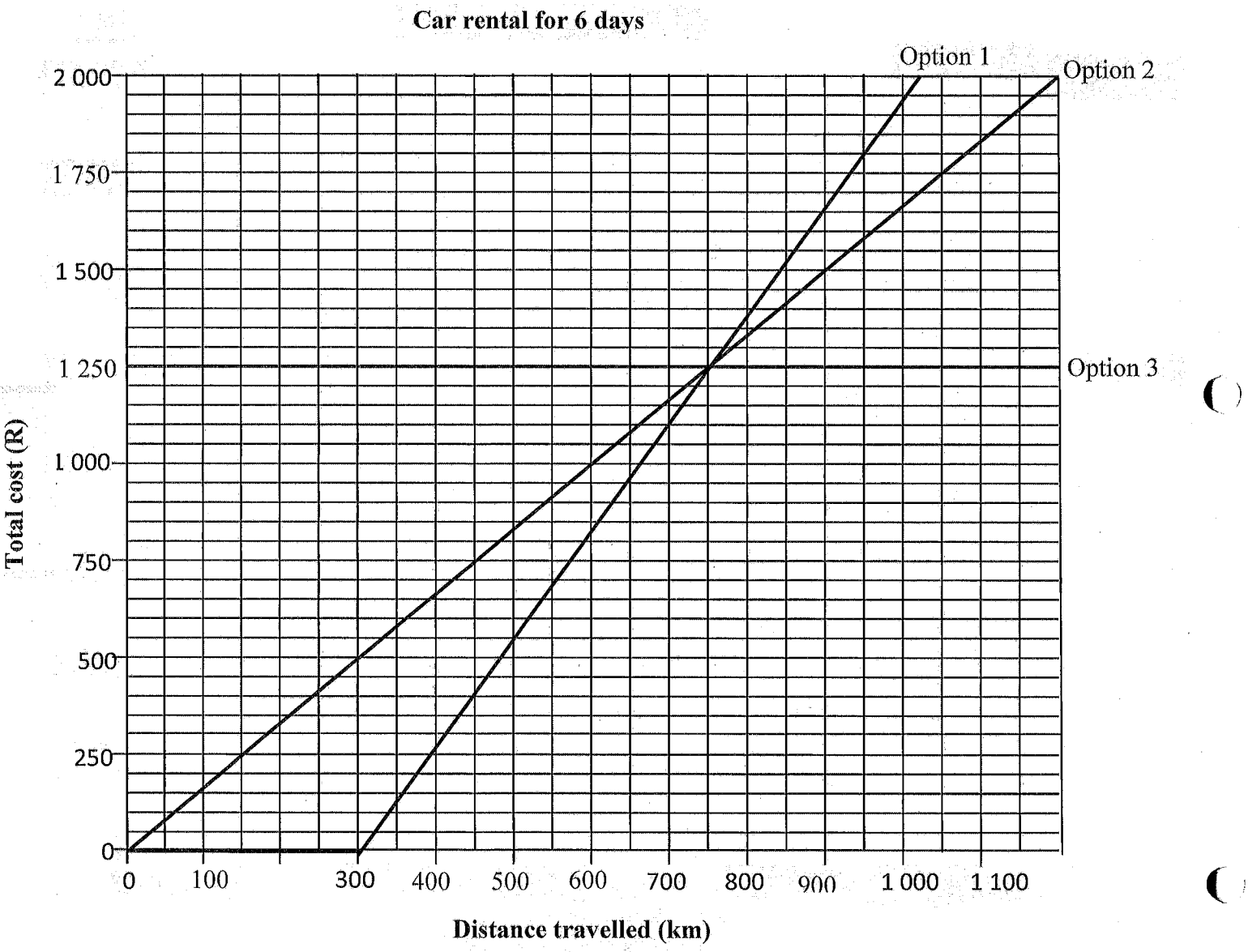
1.1 How much would the ticket in Advert 2 cost in pounds (£) if the airport taxes were 12%? (2)

1.2 Which advert offers the cheaper flight? (2)

1.3 Determine the cost (in South African Rands) of a ticket in Advert 1 if the exchange rate is £ 1 : R19. (2)

1.4 Thembisile will take another flight from O.R Tambo International airport (Johannesburg) to Ulundi airport. The flight costs R450, 00 for a single trip ticket. Determine the total return cost for the flights from London to Ulundi if she chooses the cheaper flight from London. (3)

1.5 At Ulundi airport, Thembisile will hire a car from Bob's Car Rental Company. The company gives her three different options. Study the graphs and answer the questions.



1.5.1 Write down the equations/formulae for calculating the total cost for hiring a car for using each of the options represented in the above graphs. (7)

1.5.2 How many free kilometres will Thembisile get when choosing Option 2? (2)

1.5.3 Determine the total cost of hiring a car using Option 1for travelling 400 km single trip. Show calculations. (3)

1.5.4 (a) What does the break-even point for option 1 and 2 mean in this context? (2)

(b) How much is the break-even cost for option 1 and 2? (2)

1.5.5 Which option has unlimited mileage (kilometres)? (2)
[27]

QUESTION 2

Thembisile is worried about her weight status, she weighs 110kg. She wants to reduce her weight by changing her diet. She is now a vegetarian. She pages through the magazine and finds the Italian pasta salad recipe for vegetarians.

Italian pasta salad recipe **Serves 4 people**

Ingredients

$1\frac{1}{2}$ cup shell, bow-tie or corkscrew pasta

2 cups broccoli, chopped

1 cup cauliflower, chopped

1 cup sliced fresh mushrooms

16 ounce can artichoke hearts, drained and chopped

$\frac{1}{2}$ cup chopped onions

1 cup Italian salad dressing

$\frac{3}{4}$ cup sliced black olives

1 tomato chopped

1 avocado chopped

Method

- Cook pasta according to package directions. Drain and rinse in cold water. Drain well.
- Steam broccoli and cauliflower first
- In a large bowl combine the cooked pasta with the broccoli, cauliflower, mushrooms, artichoke hearts and onion.
- Toss with the dressing then cover and chill for 4 hours before serving

Preparation time: 10 minutes

Cooking time: 10 minutes

Source: www.pastasalads.com

2.1 Determine the number of cups of pasta needed for serving 8 people (2)

2.2 Determine the amount black olives in millilitres needed for serving 4 people if one cup = 250 mℓ. (2)

2.3 Determine the rate of the can of artichoke hearts in grams if 1g = 0,035714285 ounce. (2)

2.4 Thembisile has a body mass index (BMI) of 35,9kg/m². Calculate her height in metres.

You may use the following formula:

$$\textbf{BMI} = \frac{\textbf{weight in (kg)}}{(\textbf{height in (m)})^2}$$ (4)

2.5 If Thembisile starts making the salad at 11:25, at what time will it be ready for serving? (3)

2.6 Below is a diagram of a stove that Thembisile uses to boil pasta.

Top view of a stove

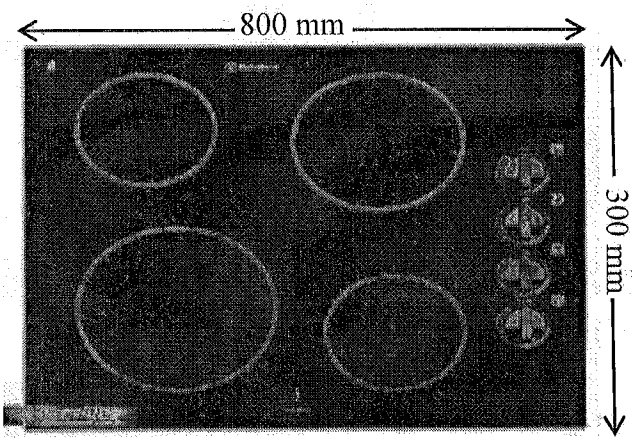


Photo of a pot with water

2.6.1 Calculate the area in square metres (m^2) occupied by the stove.

You may use the following formula:

Area of a rectangle = ℓ x w (3)

2.6.2 Calculate the circumference of the large plate of a stove if the diameter is 26cm.

You may use the following formula

Circumference = $2\pi r$ Use **π = 3,142** (3)

2.6.3 Calculate the volume of water in litres inside the pot if it is $\frac{3}{4}$ full.

You may use the following formula:

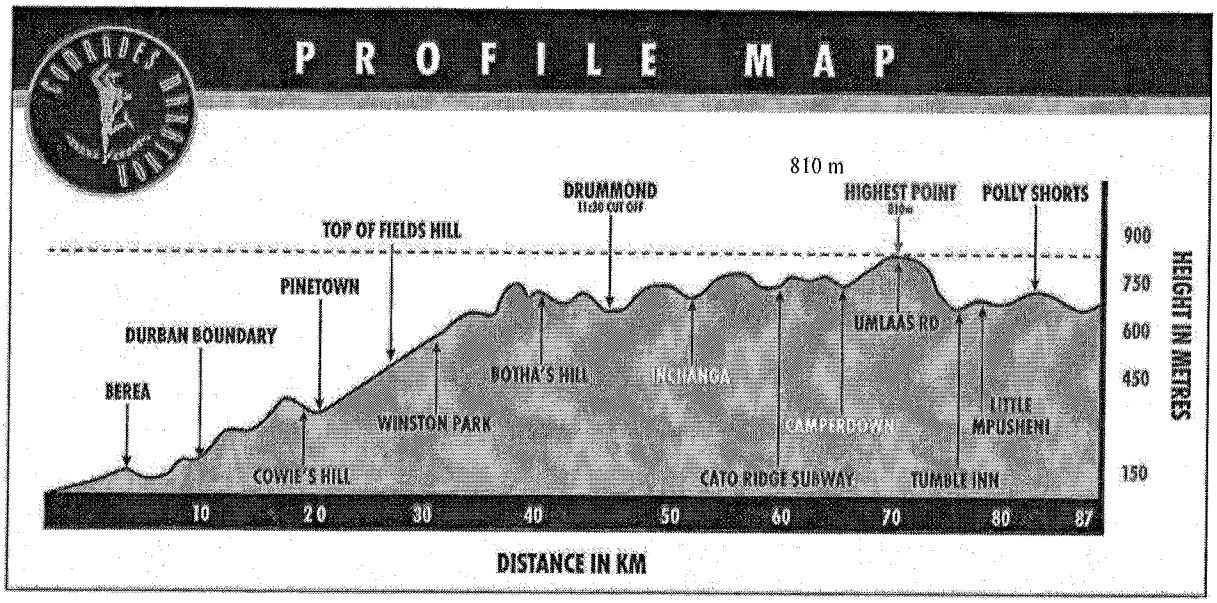
Volume of a cylinder = $\pi r^2 h$. Use **π = 3.142**

Note: 1 000 cm^3 = 1ℓ (5)

[24]

QUESTION 3

Comrades marathon is a race that is run from Durban to Pietermaritzburg every year. The starting point of the race alternates every year. Study the profile map of the comrades marathon from Durban to Pietermaritzburg below and answer the questions that follow.



www.comradesmarathon.com

3.1 Determine the total distance of the marathon in kilometres. (2)

3.2 Determine the height of the highest point in kilometres. (3)

3.3 Determine the half-way point (in kilometres) for the comrades marathon. (2)

3.4 Calculate the average speed in metres per minute of a runner from the starting point to Cato Ridge subway if he/she took 5 hours 45 minutes.

You may use the following formula

$$\textbf{Average speed} = \frac{\textbf{Distance}}{\textbf{Time}}$$ (5)

3.5 The marathon from Durban to Pietermaritzburg is called uphill run. Identify the town where the longest uphill start and estimate its distance. (2)

[14]

QUESTION 4

Mr Smith is a part time coach for learners who do long jump. He wants to select the team of players. He will select the team from Grade 12A And Grade 12B and 12C. He measures the heights of tallest learners from each class. The heights are shown in the table below.

Table 1: Heights of learners from 12A, 12B and 12C in metres

12A	1,50	1,60	1,70	1,40	1,50	1,70	1,60	1,75	1,55	1,58	1,60	1,72	1,66	1,73	1,75
12B	1,40	1,50	1,54	1,61	1,61	1,63	1,71	1,71	1,72	1,73	1,72	1,74	1,74	1,75	1,76
12C	1,41	1,42	1,48	1,48	1,50	1,50	1,52	1,53	1,55	1,58	1,60	1,61	1,62	1,70	1,75

4.1 Calculate the mean (average) height for learners in 12B. (3)

4.2 Determine the range of the heights of learners in 12A. (2)

4.3 Determine the median for the heights learners in 12C (2)

4.4 Determine the mode for the heights of learners in 12A. (2)

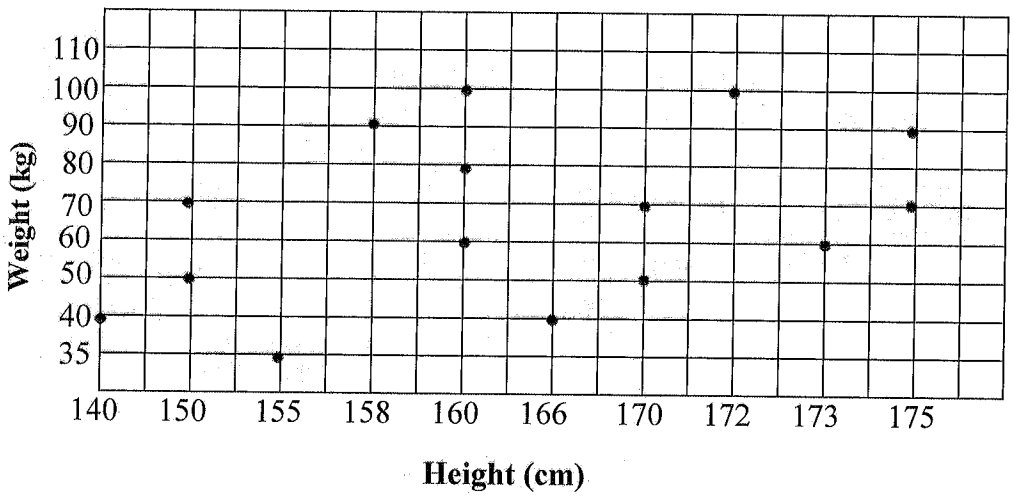
4.5 (a) Mr Smith will take all learners with a height from 1, 6 to 1,76 to form a team. How many learners will form a team from 3 classes? (2)

(b) Hence determine which class will have more learners in the team? (2)

4.6 Complete the frequency table on the answer sheet using values on the table above. (5)

4.7 Study the graph below representing height of learners and their weights in 12A and answer the questions that follow.

Graph showing heights of learners and their weights in 12A



4.7.1 What type of graph is this? (2)

4.7.2 Determine the weight of a learner whose height is 172 cm in 12A. (2)

4.7.3 Is there any correlation between the height and weight displayed in the graph above? If so what type of correlation is it? (2)

[24]

QUESTION 5

5. Job is a grade 12 learner at Keyway High school. He asks his parents to hire the car for him to use during the matric dance. The company they approached has the following types of cars available, 10 Sport Utility Vans (SUVs), 8 hatchbacks and 6 sedans.

5.1 (a) What is the probability that Job will choose a hatchback? Write your answer as a common fraction in simplest form. (3)

(b) What is the probability that Job will NOT choose a sedan? Write your answer as a decimal fraction. (3)

5.2 Job's father saved his once-off bonus of R25 000, 00 for the matric dance at the beginning of the year when Job was doing grade 10. The money has been in the account for two years. The interest rate is 1,5% **compounded half yearly**.

5.2.1 Calculate the total amount in the account after two years. (5)

[11]

TOTAL MARKS: 100

ANSWER SHEET

QUESTION 4.6

NAME: _____ **GRADE:** _____

Height intervals	Tally	Frequency
1,40 – 1,49		
1,50 – 1,59		12
1,60 - 1,69		
1,70 – 1,79	𝍸 𝍸 𝍸 II	17
TOTAL		**45**

PLEASE TEAR ON DOTTED LINE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Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

MATHEMATICAL LITERACY P1

AMMENDED

MEMORANDUM

COMMON TEST

JUNE 2016

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: ~~100~~ 95

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from the table/graph/map
SF	Substitution in the formula
O	Opinion
J	Justification
R	Rounding off
F	deriving a formula
E	Explanation

N.B. This memorandum consists of 11 pages.

QUESTION 1

Ques. No	Solution	Explanation	T&L
1.1	Cost including taxes = £420 + (12% x £ 420) ✓M = £470,40✓A OR ✓M Cost including taxes = £420 x 1.12 = £470,40✓A	1M adding 12% of £420 1A answer 1M multiplying by 1.12 or 112% 1A answer **Answer only full marks** (2)	F L1
1.2	Advert 2✓✓CA	2CA advert (2)	F L1
1.3	Advert 1 plane ticket cost=£1:R19 £505:R R=505 X 19✓M =R9595✓A	 1M multiplying by 19 1A answer **Answer only full marks** (2)	F L2
1.4	Total return cost = £470,40 x19 ✓MA = R8937,60 =R8937,60+ (R450,00 x 2) ✓M = R9837,60 ✓CA OR Total return cost =(R450 ÷ 19) x 2✓MA =£ 47.37 = £470.40 + £47.37 ✓M = £517.77✓CA	 1MA multiplying by 19 1M multiplying R450,00 by 2 1CA return cost 1MA dividing by 19 and multiply by 2 1M adding £47.37 1CA return cost (3) **Answer only full marks**	F L2

1.5.1	**Option 1** ✓A ✓M ✓M Cost = R2,78x (no. of km travelled – 300) **OR** ✓A ✓M ✓M Cost = R2,78 x (no. of km travelled more than 300) **Option 2** ✓A ✓M Cost = R1,66x no. of km travelled **CANCEL: DUE TO DIFFICULTY OF QUESTION** **Option 3** Cost = R1250,00 ✓✓A	1A calculating cost per km 1M multiplication 1M subtracting 300km **ACCEPT R2,75 to R2,78** 1A calculating cost per km 1M multiplication 1M subtracting 300km 1A calculating cost per km 1M multiplication REMOVE 5 MARKS FROM TOTAL. TOTAL = 95 2A R1250,00 (7)	F L2
1.5.2	0km✓✓A	2A answer(2)	F L1
1.5.3	Option 1 Cost = R2,78 x (no of kilometres travelled – 300) =R2,78x (400km – 300 km) = R2,78 x 100 km =R1 390,00 R250✓SF✓S✓CA	1SF substituting into the formula in **1.5.1** above 1S simplification 1CA answer 250-275 RG (3) **ANSWER ONLY: MAX. 1 MARK**	F L2

1.5.4	a)It means that the cost for option 1 and option 2 ✓E are equal or are the same.✓E b) R1 237,50✓✓ A	2E explanation showing 'costs' and 'same/equal' (2) 2A answer (2) **Accept R1250,00**	F L1
1.5.5	Option 3✓✓A	2A answer (2)	F L1
		[27]	

QUESTION 2			
2.1	$1\frac{1}{2}$ cups x 2✓M =3 cups✓A **OR** 1,5 cups x 2✓M =3 cups✓A	1M multiplying by 2 1A answer 1M multiplying by 2 1A answer **Answer only full marks** (2)	M L1
2.2	1 cup = 250ml $\frac{3}{4}$ cup =ml ml= $\frac{250 \times \frac{3}{4}}{1}$ ✓MA Amount of black olives =187,5ml✓A **OR** 1 cup= 250 ml 0,75 cup=ml $=\frac{0,75 \times 250}{1}$ ml = ✓MA = 187,5 ml✓A	1MA multiplying 250ml by $\frac{3}{4}$ 1A answer 1MA multiplying 250ml by 0,75 1A answer **Answer only full marks** (2)	M L1

2.3	Weight of the can 1g= 0,035714285 ounce grams = 16 ounces $=\frac{16x1}{0,035714285}$ ✓M =448 g✓A	1M dividing 16 by 0,035714285 1A answer **Answer only full marks** (2)	M L2
2.4	$BMI=\frac{\text{weight in kg}}{\text{height m}^2}$ $35,9kg/m^2=\frac{110\,kg}{\text{height m}^2}$ ✓SF $\text{height}^2(m)=\frac{110kg}{35,9kg/m^2}$ ✓M height^2 (m) =3,064066852 height(m)=$\sqrt{3,064066852}$✓M height(m)=1,750447615m height=1,75m✓CA	1SF correct substitution into the formula 1M dividing 110kg by BMI value 1M finding the square root 1CA answer **NO PENALTY FOR ROUNDING** (4)	M L( )
2.5	11:25 + 20 minutes ✓MA =11:45 + 4 hours (chilling time)✓M The salad will be ready at 15:45 **OR** Fifteen minutes to four **OR** 3:45 pm ✓A	1MA adding preparation and cooking time 1M adding 4 hours 1A answer **Answer only full marks** (3)	M L2

2.6.1	Area of a rectangle=ℓ x w =800mm x 300mm✓SF =240 000mm^2 ÷(1000)^2✓C =0,24m^2✓CA **OR** Area of a rectangle=ℓ x w ✓SF ✓C =(800 mm ÷ 1000) x (300 mm ÷ 1000) =0,8m x 0,3m =0,24m^2✓CA	1SF correct substitution into the formula 1C converting mm^2 to m^2 1CA answer $\frac{2}{3}$ **if did not divide by 1000^2** 1SF correct substitution into the formula 1C converting mm to m 1CA answer (3) **Answer only full marks**	M L2
2.6.2	Circumference= $2\pi r$ ✓M =2 x 3,142 x(26cm ÷ 2)✓SF =81,69 cm✓CA	1SFcorrect substitution into the formula 1M dividing diameter by 2 or radius 1CAanswer $\frac{2}{3}$ **if didn't ÷ diameter by 2** **Answer only full marks** (3)	M L2
2.6.3	Height of water=$\frac{3}{4}$ x 18 cm =13,5cm✓ Volume of a cylinder =$\pi r^2 h$ =3,142 x (12 cm)^2 x 13,5cm✓SF =6 108,05 cm^3✓CA 1ℓ=1000cm^3 ℓ=6 108,05cm^3 ÷ 1000 ✓C	1A answer 1SF correct substitution into the formula 1CA answer 1Cdividing by 1000 1CA answer (5)	M L3

	V. of water=6,10805 ℓ✓CA OR Volume (pot) = 3.142 x $(12cm)^2$ x 18cm✓SF = 8144.064 ÷ 1000 ✓C = 8.144....✓CA V. of water = $\frac{3}{4}$ x 8.144 ✓M = 6.108 ✓CA	**Do not penalise for rounding** 1SF correct substitution into the formula 1C Converting to litres 1CA answer 1M multiplying by $\frac{3}{4}$ 1CA answer (5)	
		[24]	

QUESTION 3

3.1	87 km✓✓RM	2 RM reading from the map (2) **ACCEPT : 87km - 90km**	M L1
3.2	✓RM Height of the highest point = 810 m ÷ 1 000✓M = 0,81 km ✓A	1RM reading from the map 1M dividing by 1 000 1A answer **Answer only full marks** (3)	M&P L1
3.3	43,5 km ✓✓	2RD reading from the graph **Accept : 43.5km - 45 km** (2)	M&P L3
3.4	Average Speed = $\frac{Distance}{Time}$ = $\frac{60\text{ km}}{5\text{ hours }45\text{ minutes}}$ ✓RM = $\frac{60\text{ km x }1000}{(5\text{ hours x }60)+45\text{ minutes}}$ ✓C ✓C = $\frac{60000\text{ m}}{345\text{ minutes}}$ ✓S = 173, 91 m/min ✓CA	1RM reading 60 km from the map 1Cconverting km to m 1C converting hours to minutes 1S simplification 1CA answer (5)	M&P L2
3.5	Pinetown ✓RM 15 km ✓CA	1RM reading from the map 1CA answer **ACCEPT : 14 km - 16 km** (2)	M&P L1

		[14]	

	QUESTION 4		
4.1	Mean 12B = $\frac{1,40+1,50+.....+1,76}{15}$ ✓M $= \frac{24,87}{15}$ ✓M = 1,658✓A	1M adding correct values 1M dividing by 15 1A answer **Answer only full marks** **Do not penalise for rounding**(3)	DH L2
4.2	Range 12A = 1,75 – 1,40✓M = 0,35✓A	1M subtracting 1,40 from 1,75 1A answer **Answer only full marks** (2)	DH L2
4.3	Median 12C = 1,53✓✓A	2A answer (2)	DH L1
4.4	Mode 12A= 1,60✓✓A	2A answer (2)	DH L1
4.5	(a) 27 learners✓✓A (b) 12B✓✓A	2A answer (2) 2A answer (2)	DH L1
4.6	Annexure A	1A x 5for each correct tally or frequency (5)	DH L2
4.7.1	Scatter plot✓✓A	2A answer (2)	DH L1
4.7.2	100 kg ✓✓A	2A answer (2)	DH L1
4.7.3	No correlation. ✓✓A **OR** No ✓✓A	2A for answer (2)	DH L1
		[24]	

	QUESTION 5		
5.1	(a) P(hatchback) = $\frac{8}{24}$ ✓A ✓A $= \frac{1}{3}$ ✓S	1Acorrect numerator 1Acorrect denominator 1S simplification **Answer only full marks** (3)	P L1
	(b) P(not a sedan) = $\frac{18}{24}$ ✓A ✓CA = 0, 75 ✓CA OR ✓A ✓M P(not a sedan) = 1 - $\frac{6}{24}$ =0.75✓CA	1A adding 10 and 8 1CAdenominator used in (a) above (concept of probability) 1CAanswer OR 1A for 1 (concept of probability) 1M subtracting $\frac{6}{24}$ 1CA answer **Answer only full marks** (3)	( ) ( )

5.2.1	Interest rate per half year $= \frac{1.5\%}{2}$ $= 0.75\%$ $= 0.0075$ **1st half year** Amount = R25 000,00 + (0.0075x R25 000,00) = R25 187.50✓A **2nd half year** Amount = R25 187.50+ (0.0075 x R25 187.50) = R25 376.41✓A **3rd half year** Amount = 25 376.41+ (0.0075 x R25 376.41) = R25 566.73✓A **4th half year** Total amount = R25 566.73 + (0.0075 x R25 566.73) = R25 758.48✓A	1M dividing 1.5% by 2 1A answer 1A answer 1A answer 1A answer (5) ACCEPT ANSWER IF LEARNERS USE 1,5% AS THE INTEREST SINCE IT WAS NOT INDICATED AS 1,5%p.a.	F L2
		[11]	

ANSWER SHEET

NAME: _____ **GRADE:**_____

For question 4.6

Height intervals	Tally	Frequency
1,40 – 1,49	𝍸 I✓A	6✓A
1,50 – 1,59	𝍸𝍸 III✓A	12
1,60 - 1,69	𝍸𝍸 II✓A	10✓A
1,70 – 1,79	𝍸𝍸 𝍸𝍸 I	17
TOTAL		**45**

TOTAL MARKS: 100