Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 10

NOVEMBER 2018

MATHEMATICAL LITERACY P2

MARKS: **75**

TIME: **1½ hours**

This question paper consists of 9 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions in the question paper.

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Start EACH question on a NEW page.
4. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
5. Show ALL calculations clearly.
6. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
7. Indicate units of measurement, where applicable.
8. Maps and diagrams are NOT drawn to scale, unless stated otherwise.
9. Write neatly and legibly.

QUESTION 1

1.1 Duanita works as an editor for 'The Correct Language Company'. She receives a basic salary every month. The number on the salary slip indicates the number of months she has been working for the company. Below is a copy of Duanita's salary slip for February 2018.

SALARY SLIP

Employee name: Duanita Verwey
Identity number: 8903305432083
Marital status: Single

Tax reference no.: 987234560
Bank account no.: 24681XXXX
Salary slip no.: 75
Pay date: 25 February 2018

Earnings		Deductions	
Basic Salary	**__(B)___**	Tax	R2 923,25
		U.I.F	R224,00
		Medical Aid	R1 182,00
		Pension	R1 875,00
Gross Salary	**__(B)___**	Total deductions	**__(A)___**
		Net Salary	R18 795,75

Use the above salary slip to answer the questions below.

1.1.1 Determine the missing values of **A** and **B** respectively. (4)

1.1.2 Show with the necessary calculations that the deduction for Pension is 7,5%. (2)

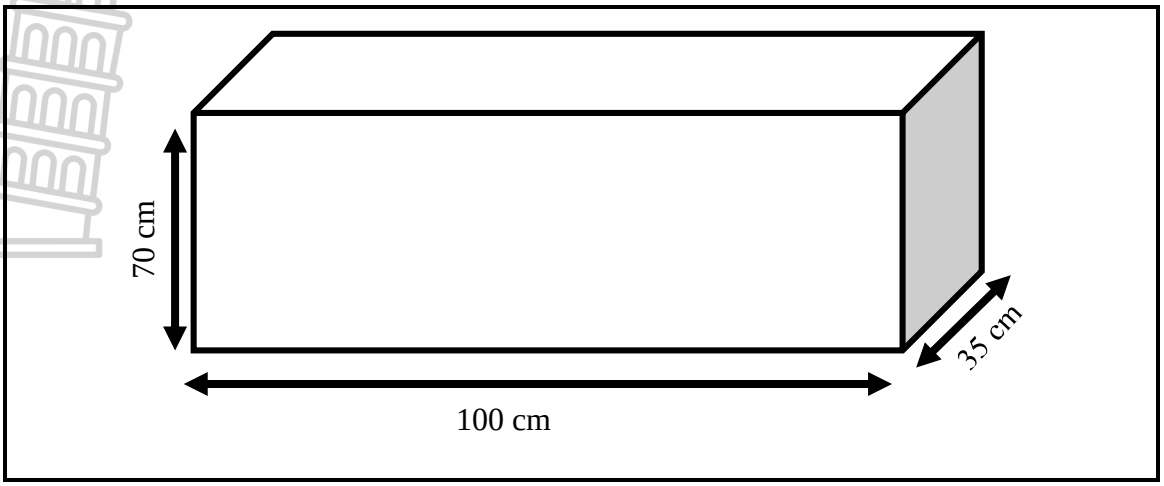
1.1.3 Determine the number of years and months that Duanita has been working for this company. (4)

1.1.4 Why do you think some of the digits have been omitted from the account number? (2)

1.1.5 Duanita is offered an increase of 6,4%. She claims that her net pay for March will be R1 000 more than the net pay for February. Verify, with the necessary calculations, whether her statement is valid or not.

NOTE: Her tax will increase by R175,00, the pension will increase by R120,00 and the medical aid and UIF will remain unchanged. (7)

1.2 Duanita wants a garden box at the back of her house to plant some herbs. She decides to buy the garden box below.



Refer to the above garden box and answer the questions below.

1.2.1 Calculate the area of the base of the garden box. Give your final answer in square metres (m^2).

You may use the following formula:

Area = length x breadth (3)

1.2.2 The garden box cannot be filled with sand right to the top. The garden box can only be filled to 75% of its height. Calculate the height of the sand in the garden box to the nearest centimetre. (3)

[25]

QUESTION 2

2.1 Water has become a critical issue in South Africa, especially in the Western Cape and the Eastern Cape, where dam levels have dropped tremendously over the past few years. Below is a table showing the major supply dams in the Western Cape.

TABLE 1:
Water storage in the major dams comprising Western Cape water supply system

Major dams	Storage					
	Capacity (*Mℓ*) Mega-litre	% 25 June 2018	% 25 June 2017	% 25 June 2016	% 25 June 2015	% 25 June 2014
Berg River	130 010	67,8	36,5	38,7	60,0	100,2
Steenbras Lower	33 517	46,5	30,2	37,1	55,4	72,6
Steenbras Upper	31767	96,5	60,6	65,8	57,4	101,3
Theewaterskloof	480 188	30,4	18,6	33,9	54,9	98,5
Voëlvlei	164 095	37,6	18,4	27,4	39,2	81,6
Wemmershoek	58 644	71,2	37,5	50,1	53,2	89,8
Total stored	898 221	383 263	218 433	320 741	474 301	846 413
% Storage		**A**	24,3	35,7	52,8	94,2

***The last 10% of a dam's water is difficult to use, so the usable water in the dam is approximately 10% less than the dam level.**

Use TABLE 1 above to answer the questions below.

2.1.1 Determine the value of **A** (the percentage storage for 25 June 2018). (2)

2.1.2 Describe a possible trend for the period in terms of the total water stored. (3)

2.1.3 Give ONE possible reason for the low dam levels from 2015 to 2017. (2)

2.1.4 Calculate the mean percentage of the dams in 2016. (3)

2.1.5 Calculate the probability that a dam will have 45% or more water stored on 25 June 2018. Write your final answer to 3 decimal places. (4)

2.2 Mervyn bought a water tank to store water. Study the diagram of the water tank below and answer the questions that follow.

The water tank has the following dimensions:
Diameter = 1 500 mm
Height = 1 820 mm

You may use the following formula and conversion:

Volume = π × radius × radius × height; where π = 3,142

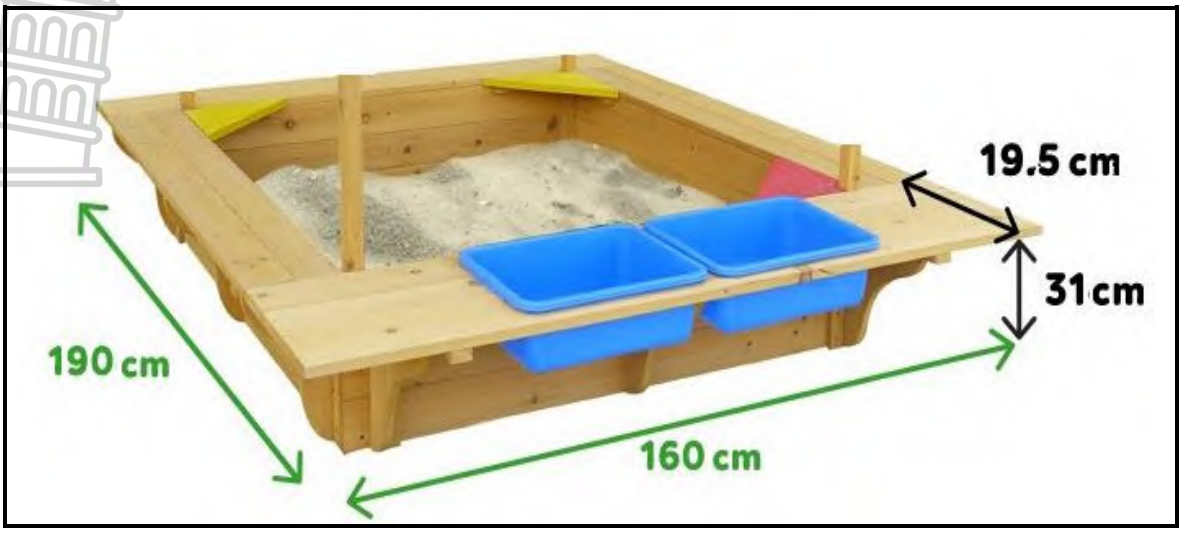
Conversion: 1 cm^3 = 1 000 litres

The capacity of the water tank is advertised as 3 000 litres. Hence, calculate the capacity of the water tank by using the dimensions and account for the difference between the advertised capacity and the capacity that you have calculated. (6)

[20]

QUESTION 3

3.1 Jona buys a sand pit for his 4-year-old daughter, Jaimee, and puts it in his backyard. Below is a diagram of the sandpit with dimensions.



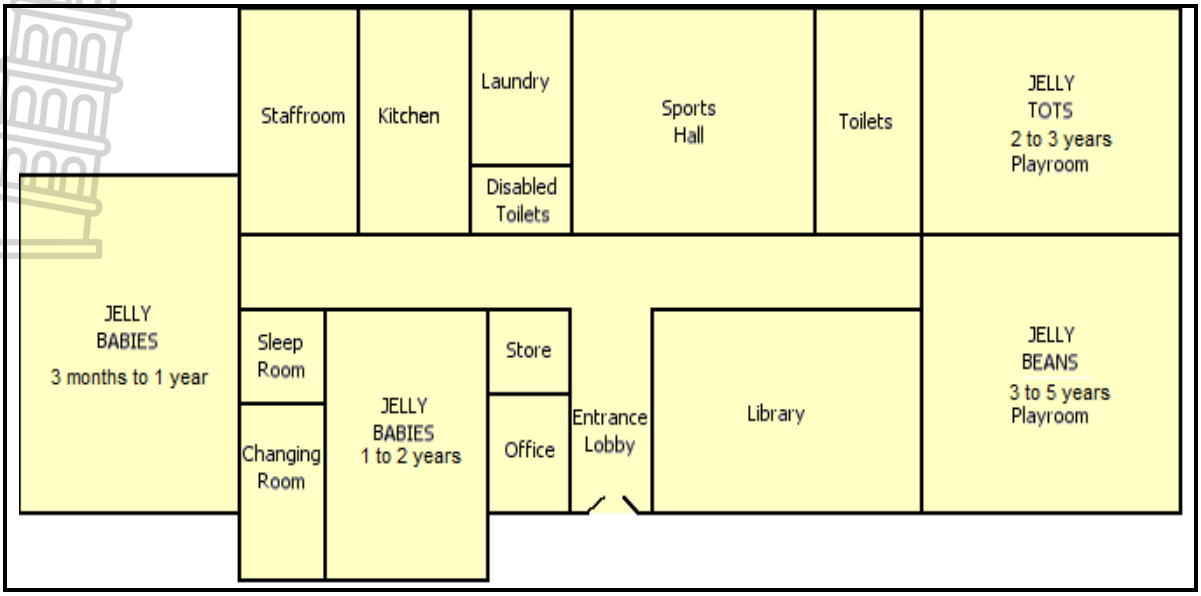
Refer to the diagram of the sandpit to answer the questions below.

3.1.1 Jona finds a space to put the sandpit, but he only considers the perimeter of the base of the sand pit. Calculate the perimeter of the base of the sand pit. Give your final answer in metres.

You may use the following formula:
Perimeter = 2 × length + 2 × breadth (3)

3.1.2 The sand that Jona wants to put in the sand pit, should only cover 80,5% of the height of the sandpit. Determine the height of the sand in the sand pit to the nearest centimetre. (2)

3.2 Jona's daughter Jaimee attends a playschool. The following is a floor plan of the playschool. Study the floor plan and answer the questions below.



3.2.1 Joan's neighbours also want to enrol their 6-year-old son at Jaimee's playschool. Give evidence from the floorplan to show whether the playschool will accept the neighbour's son. (2)

3.2.2 Does this playschool cater for disabled children? Justify your answer with evidence from the floorplan. (2)

3.2.3 Give ONE possible reason why the 3 months to 1-year-old and 1-year to 2-year-old classrooms are situated far away from the 2-year to 5-year-old classrooms. (2)

3.3

The playschool fees are structured as follows:	
AGE	**FEE PER MONTH**
3 months to 1 year and 6 months	R1 050
1 year and 7 months to 3 years and 6 months	R820
3 year and 7 months to 5 years	R550

3.3.1 Give ONE possible reason why the fees for 3 months to 1 year and 6 months are much higher than the others. (2)

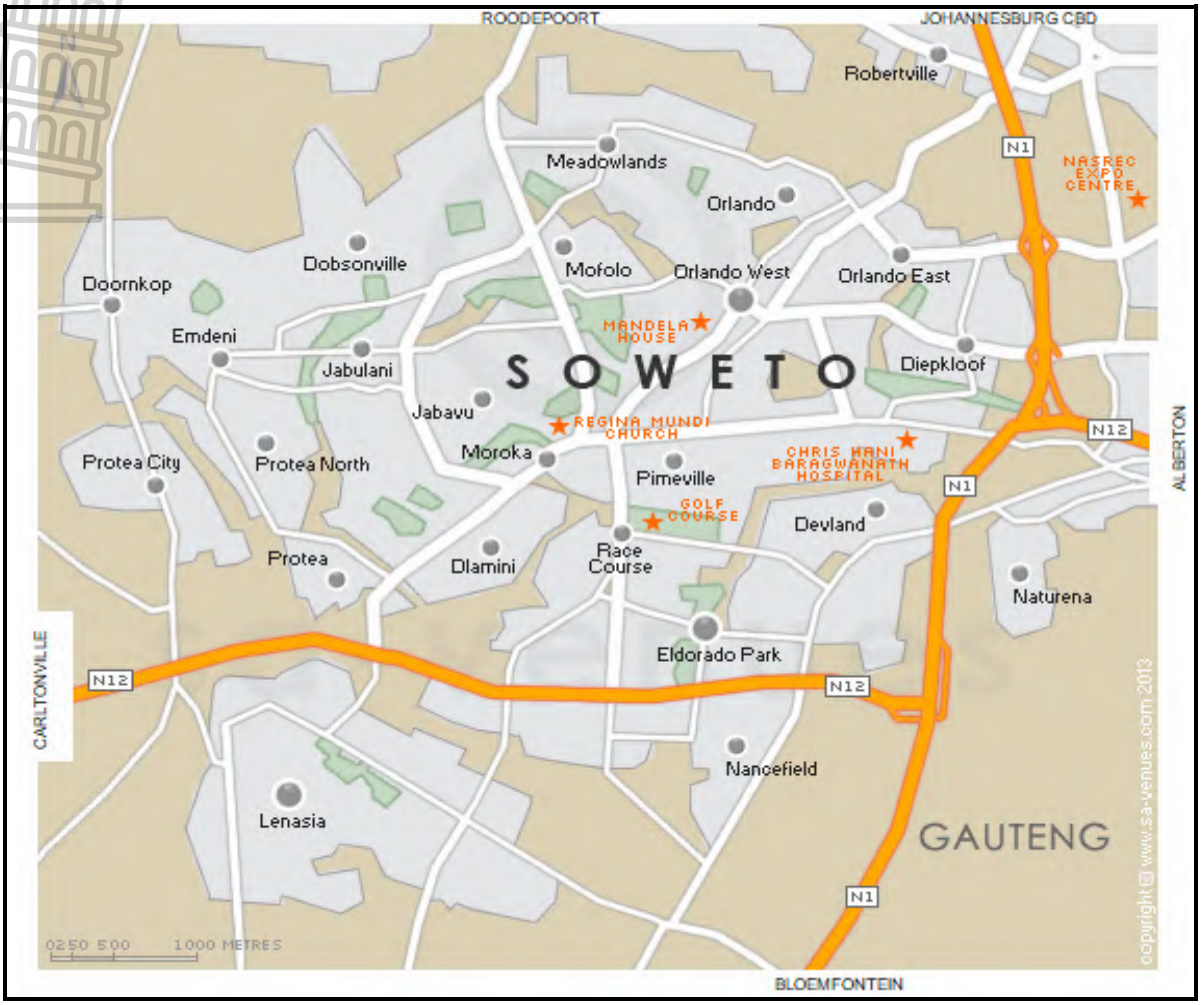
3.3.2 The playschool hosts 35 children of which nine are in the age group 3 months to 1 year and 6 months, ten in the age group 1 year and 7 months to 3 years and 6 months and the rest in the age group 3 year and 7 months to 5 years.

Calculate the playschool's income for one year if none of the learners has withdrawn. (5)

[18]

QUESTION 4

4.1 Below is an extract from a map of Soweto. Study the map and answer the questions below.



4.1.1 Describe the route that you must take, with geographical directions, if you have to travel from Johannesburg CBD to Carltonville. (4)

4.1.2 Write the bar scale (line scale) as a unit scale. (3)

4.2 4.2.1 In December 2017 the total number of tourists who visited Soweto was 1,5 million. This was an increase of 6,25% from December 2016. Calculate the number of tourists who visited Soweto in 2016. (3)

4.2.2 Give ONE possible reason why more people visit Soweto in December than in any other month. (2)

[12]

TOTAL: 75

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TO: **DISTRICTS HEADS OF EXAMINATIONS**
PRINCIPALS OF SCHOOLS IN THE FET BAND

FROM: **CES: INSTRUMENT DEVELOPMENT AND MODERATION SECTION**
MS N. MBELEKI

SUBJECT: **ERRATA – MATHEMATICAL LITERACY P2 GRADE 10 NOVEMBER 2018**

DATE: **13 NOVEMBER 2018**

The Mathematical Literacy P2 Grade 10 November was written on Monday, 12 November 2018. We were made aware of certain amendments and omissions that were discovered during the marking process.

In order to address this and to ensure that learners are not disadvantaged, the following standardised approach to marking must be adopted across the Province. The following guidelines with regard to marking was prepared in conjunction with the examiner and moderator.

ERRATA

The following error occurred on Question 2.2 – conversion of 1 cm^3 = 1 000 litres is **INCORRECT**. We would therefore suggest that QUESTION 2 be marked out of a total of 14 marks and scaled up to 20, as it would make it difficult for learners to give an opinion on the difference found.

We request that this must be brought to the attention of all educators marking these papers and sincerely apologise for the inconvenience.

Yours in education.

MS N. MBELEKI 13 November 2018 **DATE**

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GRADE 10

NOVEMBER 2018

MATHEMATICAL LITERACY P2 MARKING GUIDELINE

MARKS: **75**

Codes	Explanation
M	Method
MA	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
D	Define
J	Justification/Reason/Explain
S	Simplification
RD	Reading from a table OR a graph OR a diagram OR a map OR a plan
F	Choosing the correct formula
SF	Substitution in a formula
O	Opinion
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding Off
AO	Answer only
NPR	No penalty for rounding OR omitting units

This marking guideline consists of 5 pages.

KEY TO TOPIC SYMBOL:

F = Finance; M = Measurement; MP = Maps, Plans and other Representations
DH = Data Handling; P = Probability.

QUESTION 1 [25 marks] ✓

Ques.	Solution	Explanation	Topic and Level
1.1.1	A = R2 923,25 + R224,00 + R1 182,00 + R1 875,00 ✓M = R6 204,25 ✓A B = R6 204,25 + R18 795,75 ✓MCA = R25 000 ✓CA	1M Adding all deductions 1A Total deductions (2) **CA from (A)** 1MCA Addition 1CA Gross Pay/ Basic Salary (2)	F L2
1.1.2	% Pension deduction $= \frac{1\,875}{25\,000}$ ✓MCA × 100% ✓M = 7,5%	**CA from 1.1.1 (B)** 1MCA Correct values 1M Multiply by 100 (2)	F L2
1.1.3	Payslip no.: 75 Years = $\frac{75}{12}$ ✓MA = 6,25 years ✓A Months = 0,25 × 12 = 3 months ✓MCA ∴6 years and 3 months ✓CA	1MA Divided by 12 1M Number of years 1MCA Convert decimal part to months 1CA Years and months (4)	F L3
1.1.4	• Privacy **OR** • Confidentiality ✓✓A **OR** • Fraud ✓✓A	2A Reason (2)	F L4
1.1.5	New salary = R25 000 × 1,064 = R26 600 ✓MCA New Tax Amount = R2 923,25 + R175,00 = R3 098,25 ✓MA New Pension = R1 875,00 + R120,00 = R 1 995 ✓MA Net pay = R26 600 – (R3 098,25 + R 1 995 + R224,00 + R1 182,00) = R26 600 – R6 499,25 ✓MCA = R20 100,75 ✓CA Difference in Net Pay = R20 100,75 – R18 795,75 = R1 305,00 ✓CA Statement valid ✓O	**CA from 1.1.1 (B)** 1MCA New Salary 1MA New Tax 1MA New Pension 1MCA Subtraction 1CA New Net Pay 1CA Difference 1O Valid (7) **No mark for opinion without calculations**	F L4

1.2.1	Area of base = Length × Breadth = 100 cm × 35 cm ✓SF = 1 m × 0,35 m ✓C = 0,35 m^2 ✓CA	1SF Correct length and breadth 1C Conversion to m 1CA Area in m^2 (3) **Penalise for incorrect unit in final answer**	M L3
1.2.2	Height of sand = 0,75 × 70 cm ✓MA = 52,5 cm ✓S ≈ 53 cm ✓R	1MA 75% of 70 1S Simplification 1R Nearest cm (3)	M L2
		[25]	

QUESTION 2 [20 marks]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
2.1.1	% Storage = $\frac{383\ 203}{898\ 221} \times 100\%$ ✓MA = 42,7% ✓A	1MA Correct values multiplied by 100 1A Percentage (2) **NPR**	DH L2
	✓A ✓A		
2.1.2	From 2014 to 2017 the water storage decreased and then increased in 2018 ✓A	1A 2014 – 2017 1A Decrease 1A Increase 2018 (3)	DH L4
2.1.3	Below average rainfall ✓✓A **OR** Low rainfall	2O Reason (2)	DH L4

2.1.4	Mean % $= \frac{38,7 + 37,1 + 65,8 + 33,9 + 27,4 + 50,1}{6}$ ✓M ✓M $= \frac{250}{6}$ = 41,7% ✓CA	1M Adding all values 1M Dividing by 6 1CA Average (3) **NPR**	DH L3
2.1.5	Probability = $\frac{4}{6}$ ✓✓A ✓A = 0,667 ✓CA	2A Numerator 1A Denominator 1CA 3 dec. places (4)	P L2
2.2	Volume of water tank = π × radius × radius × height = 3,142 × 750 mm × 750 mm × 1 820 mm ✓A ✓SF = 3,142 × 75 cm × 75 cm × 182 cm ✓C = 3 216 622.5 cm^3 ✓CA = 3 216, 6225 litres ✓C The advertised capacity refers to the maximum amount of water the water tank can hold, while the calculated capacity refers to the actual content of the water tank. ✓O **Accept any other relevant explanation.**	1SF Substitution 1A Radius 1C Conversion to cm 1CA Volume 1C Conversion to litres 1O Opinion (6)	M L4
		[20]	

QUESTION 3 [18 marks]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
3.1.1	Perimeter of base = 2 × length + 2 × breadth = (2 x 190 cm) + (2 × 160 cm) ✓SF = (2 × 1,9 m) + (2 × 1,6 m) ✓C = 3,8 m + 3,2 m = 7 m ✓CA	1SF Substitution 1C Conversion to m 1CA Perimeter (3)	M L3
3.1.2	Height of the sand = 0,805 x 31 cm ✓MA = 24,955 cm ≈ 25 cm ✓SF	1MA Calculating % 1R Nearest cm (2)	M L2
3.2.1	Playschool only caters for children from 3 months to 5 years old. ✓✓A	2A Reason (2)	MP L4
3.2.2	Yes ✓A There are toilets for the disabled. ✓A	1A Yes 1O Reason (2)	MP L2

3.2.3	Safety reasons **OR** Noise levels of crying babies ✓✓A **OR** Close to the changing room ✓✓A **Accept any other relevant explanation**	2O Reason (2)	MP L4
3.3.1	The infants from 3 months – 1 year 6 months need more attention. ✓✓A They need to be changed regularly. ✓✓A **Accept any other relevant explanation**	2O Reason (2)	F L4
3.3.2	Income = (9 × 1 050) + (10 × 820) + (16 × 550) = R9 450 + R8 200 + R8 800 ✓S = R26 450 × 12 ✓M = R317 400 ✓CA	1M Multiplying and adding 1A Number of 3y7mnths – 5 yrs. 1S Simplification 1M Multiply by 12 1CA Annual income (5)	F L3
		[18]	

QUESTION 4 [12 marks]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
4.1.1	✓A ✓A Travel south on the N1, pass the offramp on the east, ✓A turn west at the intersection of the N1 and N12 and continue the N12. ✓A	1A South 1A N1 1A Turn west 1A N12 (4)	MP L4
	✓M		
4.1.2	Bar scale: 1,8 cm = 1 000 m 1,8 cm = 100 000 cm ✓C 1 cm = 55 555, 55556 cm □ 1: 55 555,55556✓CA **Accept 1,7 – 1,9** **No mark in the final answer if units indicated**	1M Measure bar scale 1C Metres to cm 1CA Unit scale **NPR** (3)	MP L3
4.2.1	Number of tourists = $\frac{1\ 500\ 000}{1{,}0625}$ ✓A ✓M = 1 411 764,706 = 1 411 765 ✓R	1A 1 500 000 1M Dividing by 1,0625 1CA Number of tourists (3)	DH L2
4.2.2	Holiday in December ✓✓A **OR** People have money to travel ✓✓A **Accept any other relevant reason**	2A Reason (2)	DH L4
		[12]	
		TOTAL:	**75**