KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 11

MATHEMATICAL LITERACY

COMMON TEST

MARCH 2023

MARKS: 100

TIME: 2 hours

This question paper consists of 10 pages, and an addendum with 1 annexure.

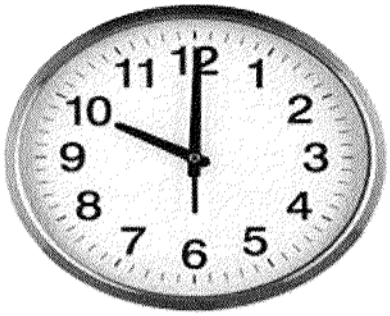
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use ANNEXURE A in the addendum to answer question 2.1.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical). Unless stated otherwise.
6. Show ALL the calculations clearly.
7. Round off, ALL the final answers appropriately according to the given context, unless stated otherwise.
8. Indicate units of measurements, where applicable.
9. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 Rulani visited his friend during the school holidays. He left his hometown in the morning and arrived at his friend's home by 15:00.

The clock below shows his departure time.



Source:https://www.istockphoto.com

Use the information above to answer the following questions.

1.1.1 Write down the departure time using the 12-hour format (2)

1.1.2 Calculate the duration of his journey in hours. (2)

1.2 The bus Rulani uses has a fuel consumption of 13.4 litres per 100km with a fuel tank capacity of 80 litres.

1.2.1 Determine the number of litres required to travel 400km. (2)

1.2.2 Calculate the cost of full tank, if the fuel costs R26.34 per litre. (2)

1.2.3 Express the fuel consumption in the form of **1 litre: …km** (2)

1.3 Below is the bill of a local town restaurant near Rulani's friend home.

BUGA LOW EATS
Served by TIM: TABLE NO: 41

1 x Fillet Steak @ R135.50
1 x 500g Rump @ R148.00
1 x Prawn Skewer @ R58.50
1 x Mushroom Sauce @ R20.00
2 x Cold Beverage @ R76.00
2 x Dessert Cups @ R48.00
AMOUNT DUE R486.00
GRATUITY (tip) _____
TOTAL PAID R540.00

Study the bill and answer the questions that follow.

1.3.1 Write down the total number of items in the bill. (2)

1.3.2 The waiter (Tim) served each guest ONE cold beverage, determine the number of guest(s) served. (2)

1.3.3 Convert 500 grams of Rump into kilograms. (2)

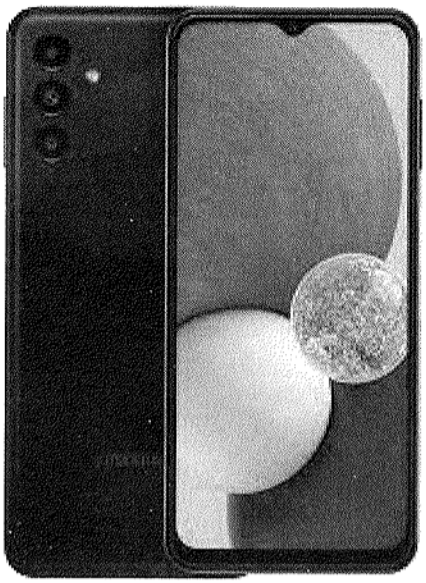
1.3.4 Calculate how much gratuity did the waiter (Tim) received from the guest(s). (2)

1.3.5 Show by calculations that the cost of ONE dessert cup is R24.00 (2)

[20]

QUESTION 2

2.1 Mrs Malungelo intends to purchase a cellphone. The service provider offered her prepaid and contract options. The attached **ANNEXURE A** shows the graphs illustrating the cost each options.



Source: https://www.google.com/imgres?

Study the attached **ANNEXURE A** and answer the questions that follow.

2.1.1 Identify ONE element that is missing on the graphs in **ANNEXURE A.** (2)

2.1.2 Which graph will possibly represent the contract option? Give a valid reason for your answer. (3)

2.1.3 **Table 1** below shows the list of equations that can be used to calculate the total cost for each graph. Use **Table 1** and **ANNEXURE A** to match the graph and the correct equation.

TABLE 1: Total costs in Rands equations

i)	Graph A	**R150 × number of minutes**
ii)	Graph B	**R2.50 × number of minutes**
		R150 + R1.60 × number of minutes

Write ONLY the correct equation next to the numbering. e.g. **i)** ..... (4)

2.1.4 If Mrs Malungelo makes calls that are less than 100 minutes per month, which option will be more economical for her? (2)

2.1.5 Explain the term *break even* according to the given context. (2)

2.2 Mathaphelo community service garden gives members of the community to maintain one-house one garden principles to fight poverty. Table 2 below indicates the fixed area of the garden with different dimensions.

Source: https://www.google.com/url?

TABLE 2: Rectangular Garden dimension with the fixed area

	Garden 1	Garden 2	Garden 3	Garden 4	Garden 5	Garden 6
Length	2	4	**A**	8	10	16
Width	32	16	12.8	8	6.4	**B**

2.2.1 Give the name of the proportion represented in **Table 2** above. (2)

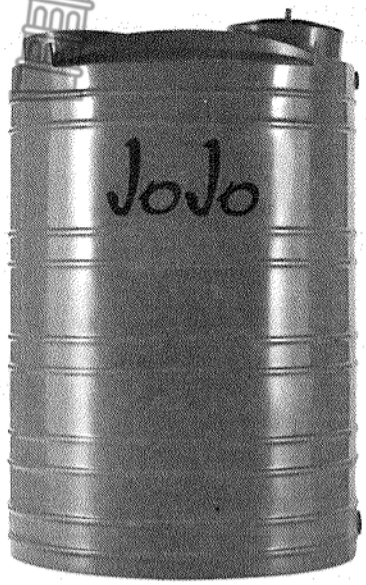
2.2.2 Calculate the maximum area of **garden 5**.
You may use the formula: **Area of rectangle = length × width** (2)

2.2.3 Hence, determine the value of **A** and **B**, the length of **garden 3**, and the width of **garden 6** respectively. (4)

2.2.4 Which garden in square shaped from **Table 2** above? (2)

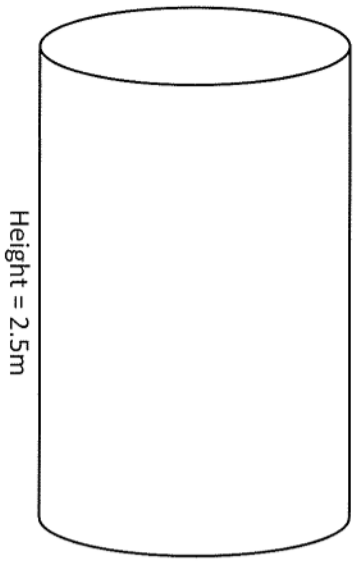
2.3 The Municipal Manager donates cylindrical tanks to the residents for garden irrigation. Each tank is 2.5m high and its diameter is 150cm.

Jojo tank Picture



Source: https://www.google.com/jojo.co.za

Jojo tank Diagram



Diameter = 150cm

2.3.1 Determine the radius of the tank in metres. (3)

2.3.2 Hence, Calculations the capacity of the tank to the nearest 1000 litres.
Note: 1 000 litres = 1m^3.
You may use the formula: **Volume of a cylinder $= 3,142 \times r^2 \times h$** (5)

2.3.3 Calculate the surface area of the tank in m^2.
You may use the formula:
The surface area of a cylinder $= 3,142 \times diameter \times h$ (3)

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QUESTION 3

3.1 Below is Khara Khara Junior School's income and expenditure list for the 2019 and 2020 financial years.

Table 3: Khara Khara Junior School income and expenditure statement.

Income	**2019**	**2020**
School fees	R693 000	R600 000
Donation	R21 000	R20 000
Sponsors	R275 000	R275 000
Registration fee	R10 000	R10 000
Total income	**R999 000**	**R905 000**
Expenses		
Salaries	R430 000	R 468 000
Stationery	R21 000	R18 300
Services and maintenance	R11 700	R15 300
Transport	R19 400	R20 000
Food	R438 000	R520 000
Telephone and internet	R22 000	R11 000
Total expenses	**R942 100**	**R1 052 600**

Study **Table 3** and the information above to answer the question that follows.

3.1.1 Define the term *income* in the given context. (2)

3.1.2 Name TWO items that could be classified as services and maintenance. (3)

3.1.3 The school principal indicates that a school will NOT be able to pay all expenses in the 2020 financial year.

Critically comment on the statement made by the school principal. (3)

3.1.4 Give ONE example of the fixed expense from the table above. (2)

3.1.5 Identify ONE expense that has decrease by 50% from 2019 to 2020. (2)

3.1.6 The school administrator states that the percentage difference in total expenses between the two years is greater than 11.73%. Verify this claim by calculations. You may use the formula write:

$$\textbf{\% Difference} = \frac{\textbf{Total expenses in 2020} - \textbf{Total expenses in 2019}}{\textbf{Total expenses in 2019}} \times \textbf{100\%}$$ (4)

3.1.7 The school charges each learner a registration fee of R50. If the ratio of boys to girls is 2:3. Determine the number of girls in the junior school. (5)

3.2 The school will paint a rectangular wall with a total length of 80m and a uniform height of 2.1m. The paint with a spread rate of 2.5 litres per 10 m^2 will be used to paint the wall with two coats.

Source: https://www.google.com/url?

3.2.1 Calculate the area of the wall to be painted in square metres. (3)

You may use the following formula:

Area of the wall =length × height.

3.2.2 Hence, calculate the number of litres of paint required to paint the wall. (4)

3.2.3 The school will paint the wall if the day temperature is more than 25°C. The SGB member claims that if the temperature is 86.6°F the school will not paint the wall. Verify this claim by showing all calculations. (4)

You may use the formula:

$°C = (°F - 32°) \div 1.8$

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QUESTION 4

4.1 Miss Khan uses her fitness watch tracker and smartphone app to record her daily workout. Below is the table showing her results.

Table 4: Khan's daily running records

End time	12:45
Steps covered	5 426
Running time	21min 00sec
Calories burnt	1232 cal.
Distance covered	5.89km
Daily step target	6000

Source: https://www.google.com/url?

Study the information and **Table 4** above to answer the questions that follow

4.1 Write down the ratio of the steps covered to daily target steps in the simplest form. (2)

4.2 Show by calculations that her speed is 3min and 33sec per kilometre. (3)

4.3 Name TWO other workout activities that miss Khan can track and record using her fitness watch. (4)

4.4 Convert 5.89km to miles if **1mile = 1.608km.** (2)

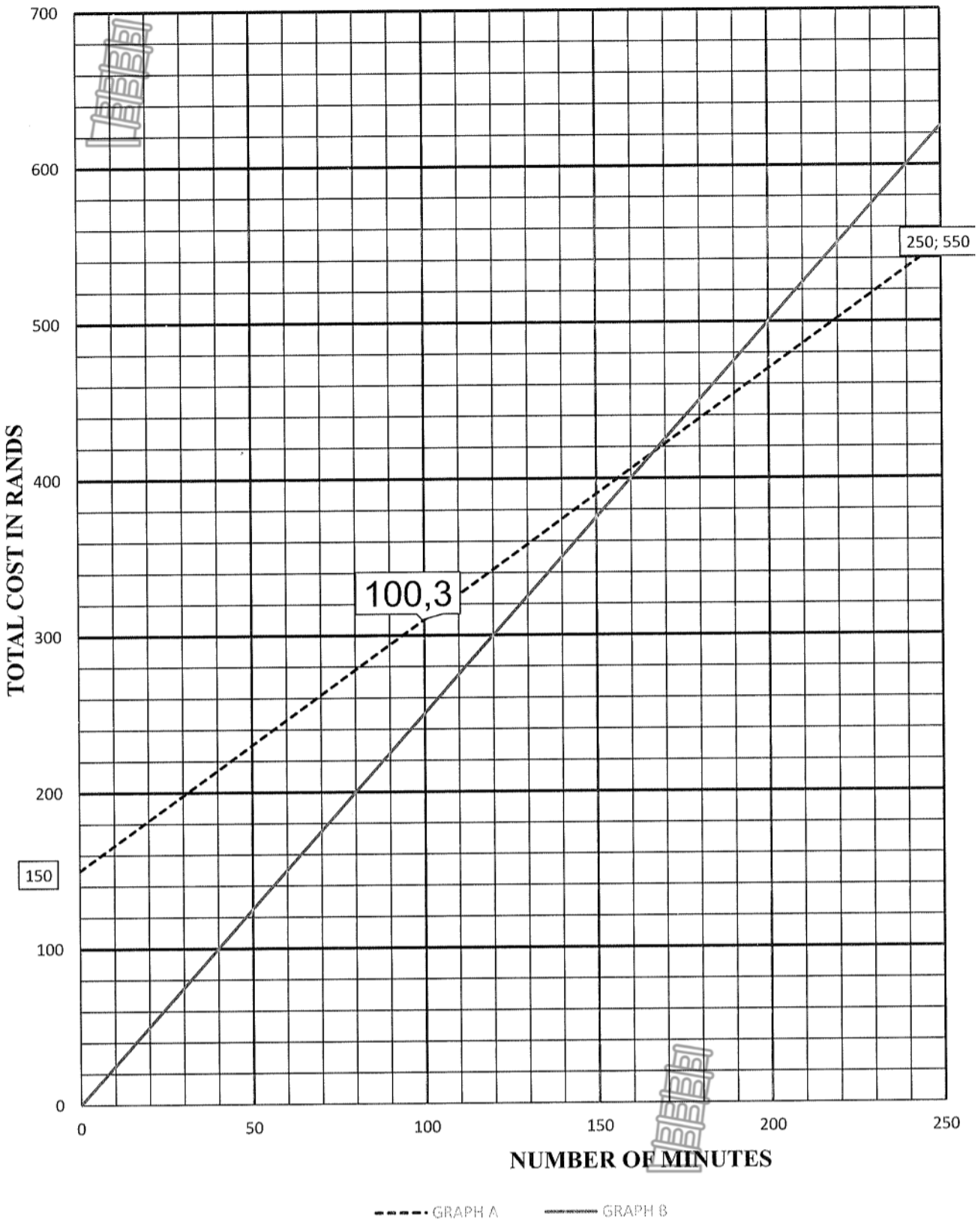
4.5 Miss Khan indicates that she needs to double her target steps to burn 2 464 calories. Show by calculations whether her claim is valid or not. (3)

[14]

TOTAL: 100

ANNEXURE A

Question 2.1



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MARKING GUIDELINE

MARKS: 100

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy (Answer)
C	Conversion
S	Simplification
RT/RG/RD	Reading from a table/graph/diagram
NPR	No penalty for units/correct rounding
SF	Correct substitution in a formula
O	Opinion/reason/deduction/example
J	Justification
R	Rounding off
F	deriving a formula
E	Explanation
U	Units
AO	Answer only full marks

This marking guideline consists of 5 pages.

QUESTION 1 [20 MARKS] ANSWER ONLY FULL MARKS			
QUE	**SOLUTION**	**EXPLANATION**	**T/L**
1.1.1	10:00am✓✓A	2A, Correct time format **Accept 10am** (2)	M L1
1.1.2	✓MA Duration = 15:00 – 10:00 = 5 hours✓A	1MA, Subtracting times 1A, Duration **AO** (2)	M L1
1.2.1	No. of litres required = $\frac{400}{100} \times 13.4$✓M =53.6 l✓CA	1M, Multiplying by 13.4 1CA, Number of litres **AO** (2)	B L1
1.2.2	Full tank cost = 80 litres × R26.34 ✓M =R2 107.20 ✓CA	1M, Multiplying by R26.34 1CA, Correct cost **AO** (2)	F L1
1.2.3	13.4L : 100km 13.4 13.4 ✓M 1litre: 7.462 ...km✓A	1M, Dividing both side by 13.4 1A, Answer **AO** (2)	B L1
1.3.1	8 ✓✓A	2A, Correct Number of items (2)	F L1
1.3.2	2 ✓✓A	2A, Answer (2)	F L1
1.3.3	Weight = $\frac{500g}{1000}$✓C = 0,5kg✓A	1C, Conversion 1A, Answer **AO** (2)	M L1
1.3.4	Gratuity = R540 – R486 ✓M = R54 ✓CA	1M, Subtracting correct values 1CA, Answer **AO** (2)	F L1
1.3.5	Cost of dessert cup = $\frac{R48}{2}$✓✓A = R24	2A, Dividing correct R48 by 2 (2)	F L1
		[20]	

QUESTION 2 [34 MARKS]			
QUE	**SOLUTION**	**EXPLANATION**	**T/L**
2.1.1	Heading/Labels of the graph✓✓A **OR** Title of the graph✓✓A	2A, Answer (2)	F L1
2.1.2	✓A ✓✓O Graph A , the graph has a fixed cost of R150	1A, Answer 2O, Reason (3)	F L2
2.1.3	i) R150 + R1,60 ×number of minutes ✓✓A ii) R2,50 ×number of minutes✓✓A	2A, Answer 2A, Answer (4)	F L2
2.1.4	Graph B, ✓✓RG **OR** prepaid option ✓✓ RG	2RG, Answer (2)	F L1
2.1.5	It is when the contract option and prepaid have the same total cost for the same number of talk time minutes. ✓✓E	2E, Explanation (2)	F L1
2.2.1	Indirect proportion ✓✓A **OR** Inverse proportion ✓✓A	2A, Answer í(2)	M L1
2.2.2	Area = 10m × 6,4m ✓SF =64m^2✓S	1SF, Correct substitution 1S, Simplification (2)	M L2
2.2.3	**A** = $\frac{64m^2}{12,8m}$ ✓M = 5m✓A **B** = $\frac{64m^2}{16m}$ ✓M = 4m✓A	**CA from 2.2.2** 1M, Dividing by 12.8 1A, Answer 1M, Dividing by 16 1A, Answer (4)	M L3
2.2.4	Garden 4✓✓RT	2RT, Answer (2)	M L1
2.3.1	Radius = 150cm ÷100 ✓C = 0,15m÷2✓M = 0,75m✓A	1C, Conversion 1M, Dividing by 2 1A, Correct radius (3)	M L2
2.3.2	Volume = 3,142 × 0,75m ×0,75m ×2,5m ✓SF ✓CA =4,4184375m^3 ×1000 ✓C = 4 418,4375 litres ✓S ≈ 4000 ℓ ✓R	**CA from 2.3.1** 1SF, Substitution 1CA, Simplification 1C, Conversion 1S, Simplification 1R, Rounding (5)	M L4
2.3.3	✓SF ✓C SA = 3,142 × 0,15m ×2,5m =1,17825m^2✓CA	**CA from 2.3.1** 1SF, Substitution 1C, Simplification 1CA, Answer (3)	M L2
		[34]	

QUESTION 3 [32 MARKS]			
QUE	**SOLUTION**	**EXPLANATION**	**T/L**
3.1.1	Total amount of money earned/received. ✓✓A	2A, Answer	F L1
3.1.2	Grass cuttings✓✓A **OR/AND** Machine repairs✓✓A **OR/AND** Refuse removal✓✓A **OR/AND** Electricity✓✓A **OR/AND** Water & sanitation✓✓A **OR/AND** Rates✓✓A	3A, Answer **(2 marks for the first option and 1 mark for the second option)** (3)	F L4
3.1.3	The principal is correct, ✓A Total expenses are greater than the total income.✓✓O	1A, Opinion 2O, Verification **Accept expenses greater than income** (3)	F L4
3.1.4	Salaries✓✓A	2A, Answer (2)	F L1
3.1.5	Telephone and internet✓✓A	2A, Answer (2)	F L2 Type e
3.1.6	✓SF ✓M % diff = $\frac{R1\,052\,600 - R942\,100}{R942\,100} \times 100\%$✓S = 11,73% Invalid statement✓J	1SF, Substitution 1M, Multiplying by 100% 1S, Simplification 1J, Justification. (4)	F L3
3.1.7	Number of learners registered = R10 000÷R50✓MA =200✓A ✓M Number of girls = $\frac{3}{5} \times 200$✓A = 120✓CA	1MA, Dividing correct values 1A, Number of learners 1A, Concept of sharing ratio 1A, Multiplying by 200 1CA, number of girls (5)	F L4
3.2.1	✓SF Area = 80m × 2,1m✓S =168m^2 ✓A	1SF, Correct Substitution 1S, Simplification 1A, Answer (3)	M L2
3.2.2	✓M ✓✓MA Number of litres = $\frac{168}{10} \times 2.5 \times 2$ = 84 ✓CA	**CA from 3.2.1** 1M, Dividing by 10 2MA, Multiplying by 2.5 x 2 1CA, Number of litres (4)	M L3

QUE	SOLUTION	EXPLANATION	T/L
3.2.3	°C= (86,6 – 32) ÷1,8 ✓SF = 54,6÷1,8✓S =30,333✓A The claim is invalid✓O	1SF, Substitution 1S, Simplification 1A, Answer 1O, Verification **NPR** (4)	M L3
		[32]	

QUESTION 4 [14 MARKS]			
QUE	**SOLUTION**	**EXPLANATION**	**T/L**
4.1	5 426 : 6 000 ✓A 2 713 : 3 000 ✓A	1A, Correct ration and order 1A, Simplified ratio (2)	M L1
4.2	Speed = 21 min / 5.89km✓MA = 3,56536min✓A = 3min + 0, 5653.×60✓C = 3min and 33 sec	1MA, Dividing by 5.89km 1A, Answer 1C, Conversion (3)	M L2
4.3	Cycling✓✓A **OR/AND** Walking✓✓A **OR/AND** Aerobics✓✓A **OR/AND** Gymanstics✓✓A **OR/AND** Weight Lifting✓✓A	4A, Answer (4)	M L4
4.4	Distance miles = $\frac{5,89km}{1,608km}$✓MA = 3,66miles✓A	1MA, Dividing by 1,608 1A, Answer **AO** (2)	M L2
4.5	Steps = 6000 × 2 = 12000 ✓MA Calories burnt = $\frac{12\,000}{5\,426} \times 1232\ cal.$ ✓M = 2 724,659… Invalid statement ✓CA	1MA, Multiplying by 2 1M, Dividing by 5 426 1CA, justification (3)	M L3
		[14]	
		TOTAL: 100	