Please paste the barcoded label here	TOTAL MARKS

NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2021

MATHEMATICAL LITERACY: PAPER II

EXAMINATION NUMBER													

Time: 3 hours 150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of:
   - 24 pages
   - 4 questions
2. Please check that your question paper is complete.
3. Answer ALL the questions.
4. Answer on this question paper.
5. It is strongly suggested that all working details be shown.
6. Approved non-programmable calculators may be used in all questions.
7. It is in your own interest to write legibly and to present your work neatly.
8. Maps and diagrams are not necessarily drawn to scale, unless stated otherwise.
9. Three blank pages (pages 22 to 25) are included at the end of the paper. If you run out of space for a question, use these extra pages. Clearly indicate the question number of your answer should you use this extra space.

Question	1		2		3		4		Total	
	Marker	Mod.	Marker	Mod.	Marker	Mod.	Marker	Marker	Marker	Mod.
Mark										
Signature										
Total	52		31		42		25		150	

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QUESTION 1

People use gyms to get fit or in shape. Bobby is passionate about this industry and wants to start his own gym called 'Flex'.



1.1 Use the floor plan on the next page to answer the questions that follow:

1.1.1 The floor plan states that the width of the office is 6 feet 5½ inches (6' 5½"). Determine the width in cm, given the following:

1 foot = 12 inches
1 inch = 2,54 cm

(5)

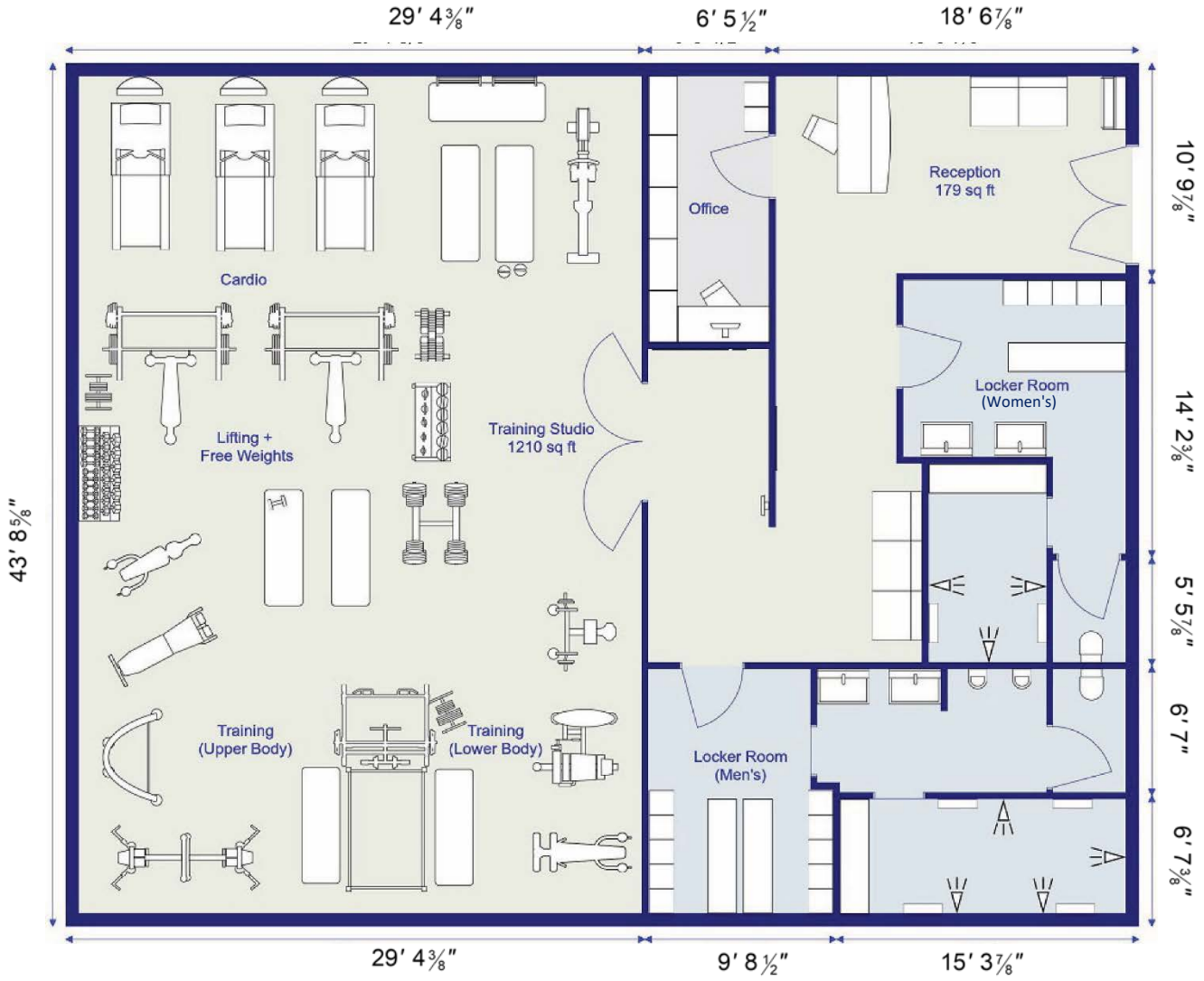
1.1.2 Using the answer you calculated in Question 1.1.1, determine if the scale of the plan rounded off to the nearest whole number is 1:109.

(4)

1.1.3 Using the ratio scale of 1:109, determine the length of the office (in m), correct to one decimal place.

(4)

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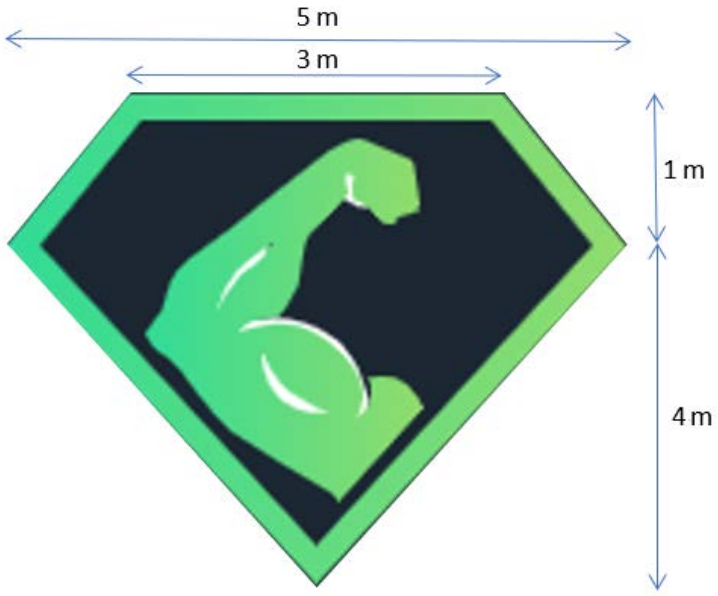


1.2 One of the showers in the men's change room is not working. Determine the percentage probability of a member of the gym choosing that shower, if choosing any one of the showers is equally likely.

(3)

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1.3 The owner of the gym wants to put the gym logo on one of the big walls in the gym. Use the information in the diagram below to answer the questions that follow:

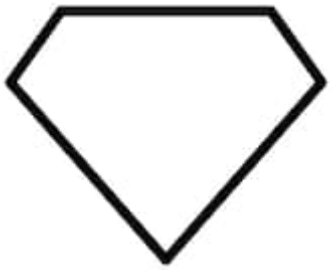


You may use the following formulae:

$$\text{Area}_{Rectangle} = length \times breadth$$

$$\text{Area}_{Triangle} = \frac{1}{2} base \times \perp height$$

1.3.1 The owner needs to cut out the diamond shape of the logo from wood and then paint it black before adding the green. By means of a calculation, show that the diamond shape is 14 m^2.



(7)

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1.3.2 Five litres of the black paint covers 300 000 cm^2. Determine how many litres of paint will be required to paint the diamond shape and hence, determine how many litres of paint will need to be purchased for the diamond shape if the paint is only sold in one-litre tins.

(5)

1.3.3 The owner wants the image of the flexed arm to be raised so he uses a 3D mould to make it. The total surface area of the flexed arm is 4 m^2 and it will protrude by 20 mm.

The resin for the mould is mixed with a hardener in a ratio of 9:1.

The owner states that he would need approximately 8 000 mℓ of hardener. By means of a calculation, verify whether he is correct if 1 m^3 = 1 000 ℓ.

(9)

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1.4 The gym offers a special joining contract for this month:

The initial gym contract will be R1 000 per month. For every 10 visits the amount decreases by R100 until the member's monthly cost is only R200 per month. It will then stay at R200 per month for the duration of the contract.

1.4.1 Determine after how many visits to the gym the contract will reach R200 per month.

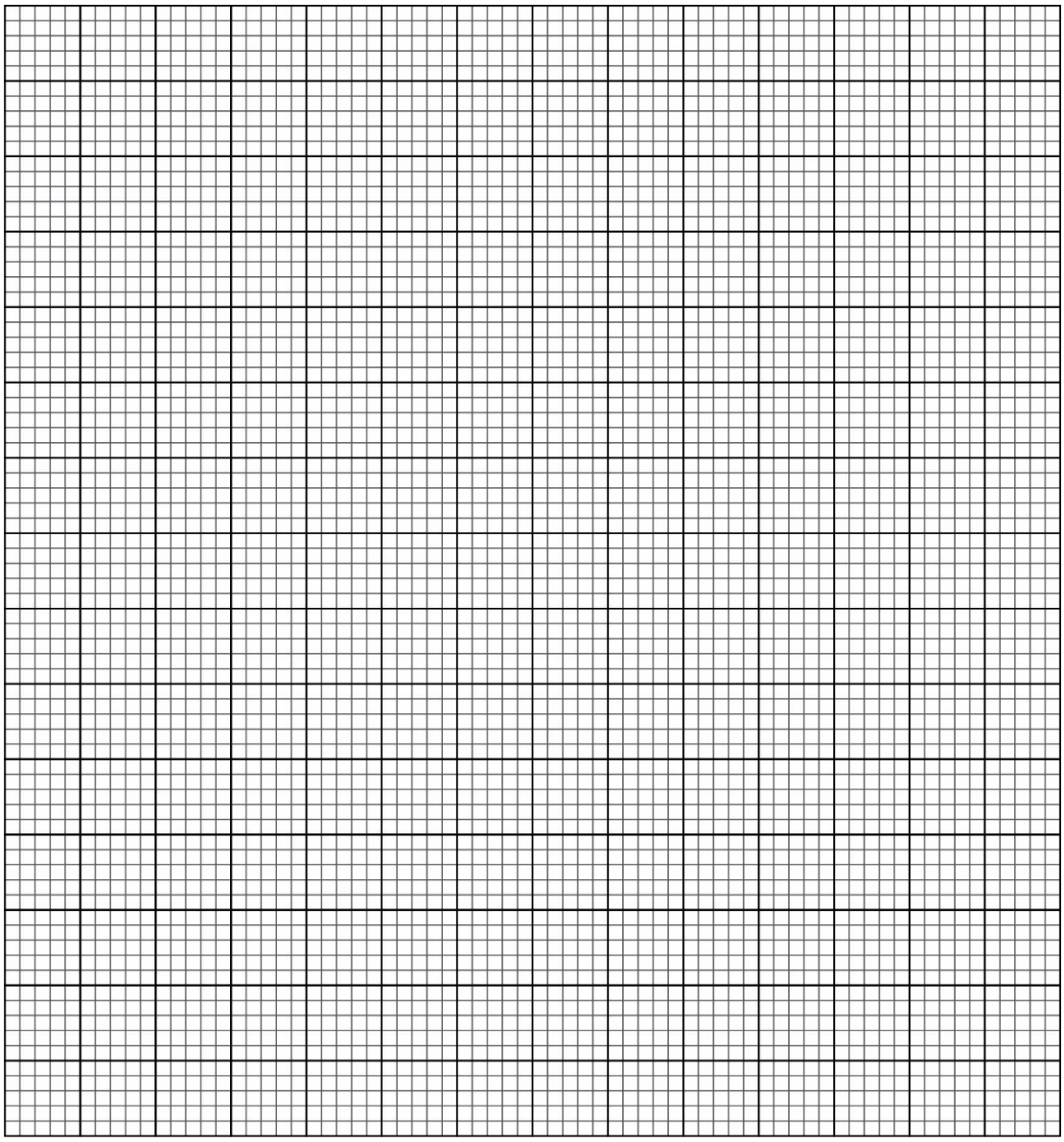
(3)

1.4.2 The member manages only 25 visits to the gym per month. If the member started the contract in October, determine in which month the member will reach the R200 monthly fee.

(4)

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1.4.3 Plot the points and join them appropriately on the graph paper below to represent the relationship of the contract in terms of cost versus number of visits (up to 100 visits).



(8)
[52]

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QUESTION 2

2.1 In Mpumalanga, the Forever Resort located at Blydepoort Canyon has several walking trails. On the page that follows is the map of the resort and its trails. Use it to answer the questions that follow:

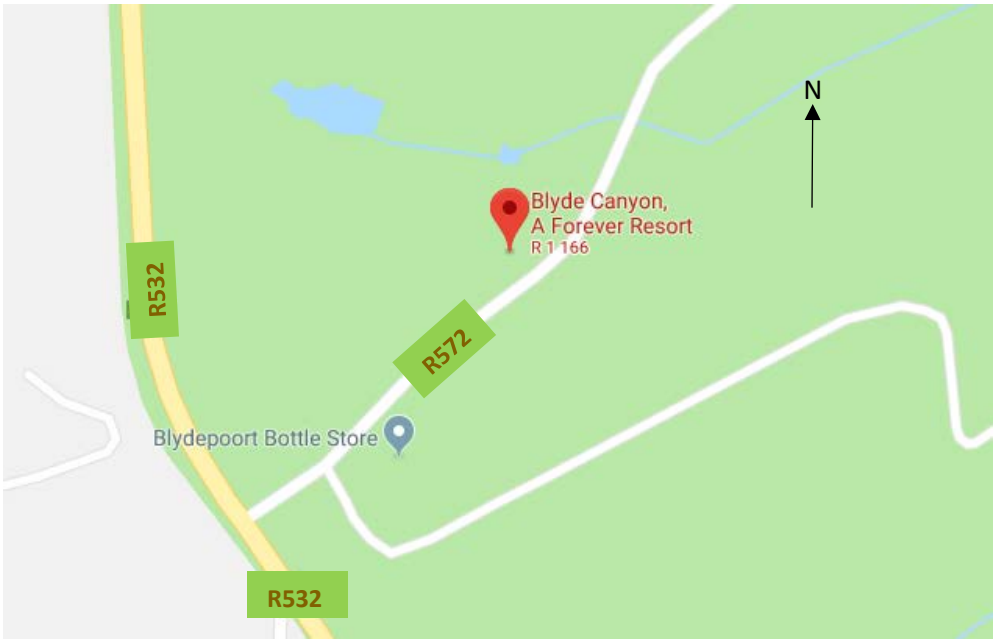


2.1.1 This is a sign on one of the trails. Indicate with the letter 'X' on the map where this sign would be found.



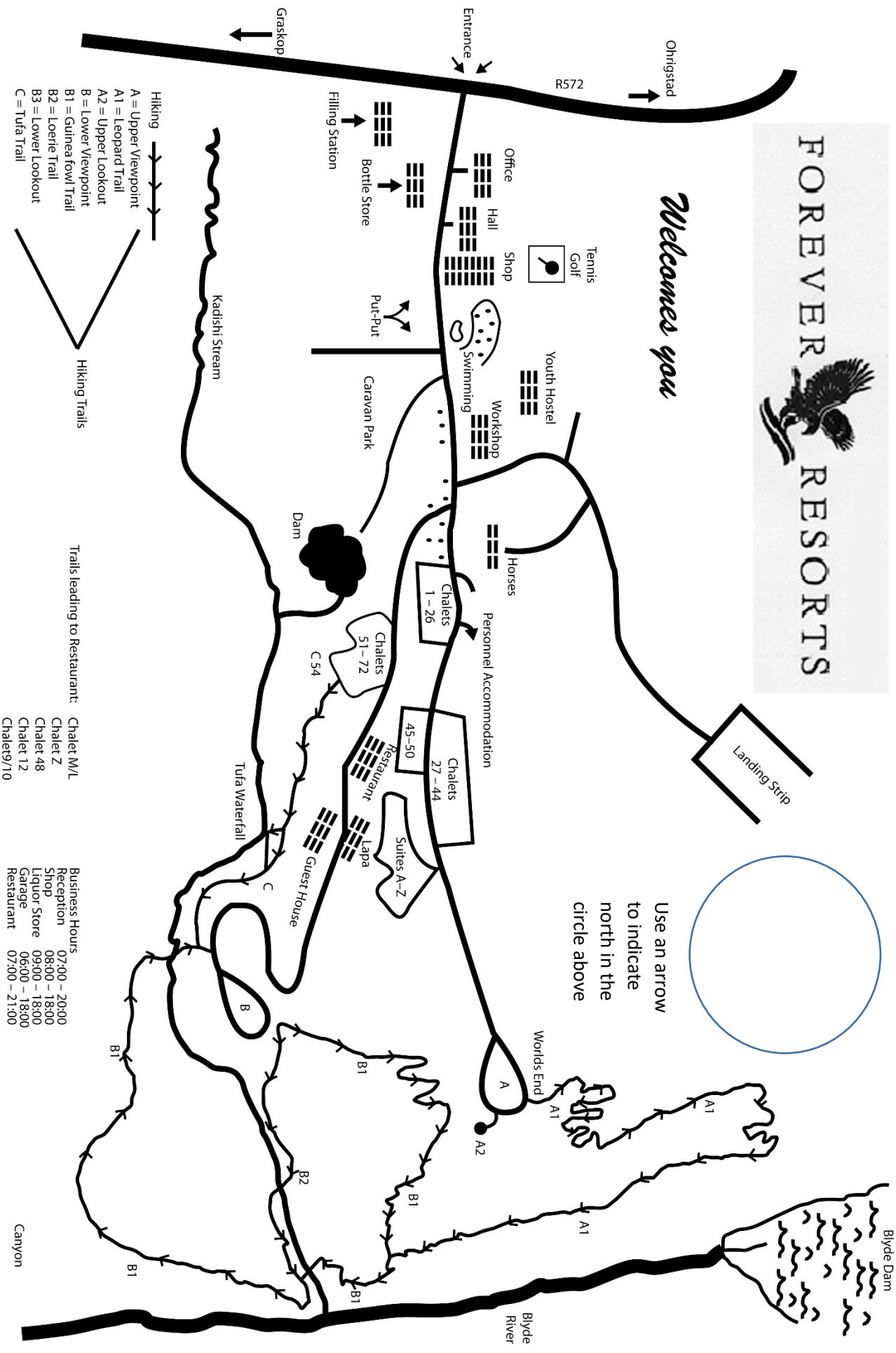
(2)

2.1.2 Below is a screenshot from Google Maps of the same area and it indicates where north is. Use this to draw an arrow indicating north in the circle on the resort map.



(2)

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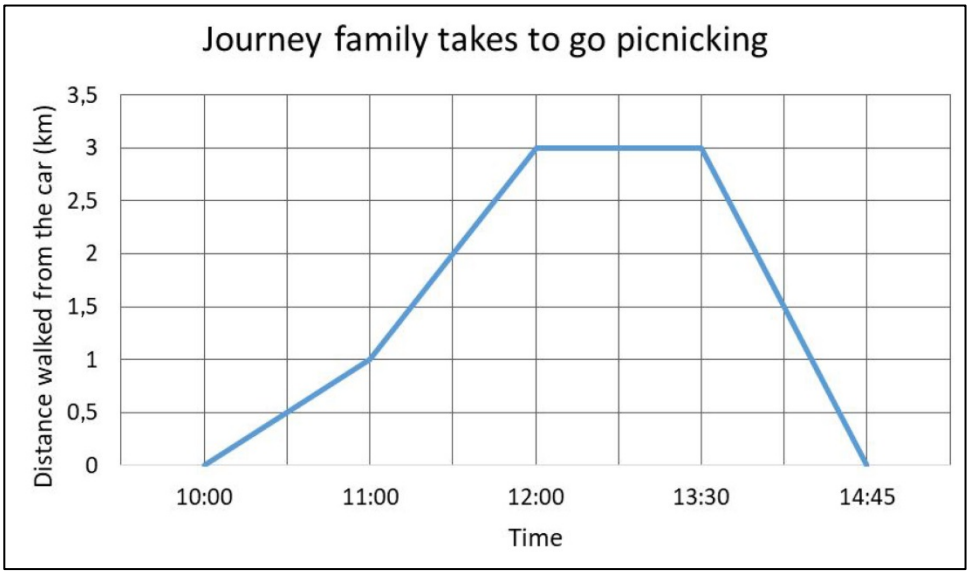

FOREVER RESORTS
Welcomes you
Ohrigstad
R572
Entrance
Graskop
Office
Hall
Shop
Tennis
Golf
Swimming
Youth Hostel
Workshop
Horses
Bottle Store
Filling Station
Put-Put
Caravan Park
Kadishi Stream
Dam
Chalets 1 – 26
Chalets 51 – 72
C 54
Chalets 27 – 44
45–50
Personnel Accommodation
Restaurant
Lapa
Suites A–Z
Guest House
Tufa Waterfall
C
B
A
A1
A2
B1
B2
Worlds End
Landing Strip
Use an arrow to indicate north in the circle above
Blyde Dam
Blyde River
Canyon
Hiking
A = Upper Viewpoint
A1 = Leopard Trail
A2 = Upper Lookout
B = Lower Viewpoint
B1 = Guinea fowl Trail
B2 = Loerie Trail
B3 = Lower Lookout
C = Tufa Trail
Hiking Trails
Trails leading to Restaurant:
Chalet M/L
Chalet Z
Chalet 48
Chalet 12
Chalet9/10
Business Hours
Reception 07:00 – 20:00
Shop 08:00 – 18:00
Liquor Store 09:00 – 18:00
Garage 06:00 – 18:00
Restaurant 07:00 – 21:00

2.1.3 A hiker would like to hike to the Tufa Waterfall. Should he park at the upper or lower viewpoint if he wants to hike the shortest distance to the waterfalls?

(2)

2.2 A family decides to park their car at one of the viewpoints, hike one of the trails, have a picnic, and then return to their car. Below is a graph that depicts this journey.





2.2.1 Explain, by referring to the context, why the gradient of the graph from 10:00 to 11:00 differs from the gradient of the graph from 11:00 to 12:00.

(2)

2.2.2 Determine the average speed, in km/h, that the family hiked at from 13:30 until 14:45. You may use the following formula:

$$distance = speed \times time$$

(4)

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2.2.3 Convert your answer from Question 2.2.2 into metres per second.

(4)

2.3 This resort also offers accommodation. A family of six decides to stay at this resort from 27 December 2019 until 3 January 2020.

The following rates can be found on Forever Resorts' website:

SEASONS & DATES

High Season	Peak Season
07 January – 19 March 2019 24 March – 17 April 2019 22 April – 12 December 2019	20 March – 23 March 2019 18 April – 21 April 2019 13 December '19 – 04 January '20

6-Sleeper Chalet

High Season	Peak Season
R3 095,00/night	R3 432,00/night

[Source: <www.foreverblydecanyon.com>]

2.3.1 Determine the cost per person for the family for the duration of their stay.

(4)

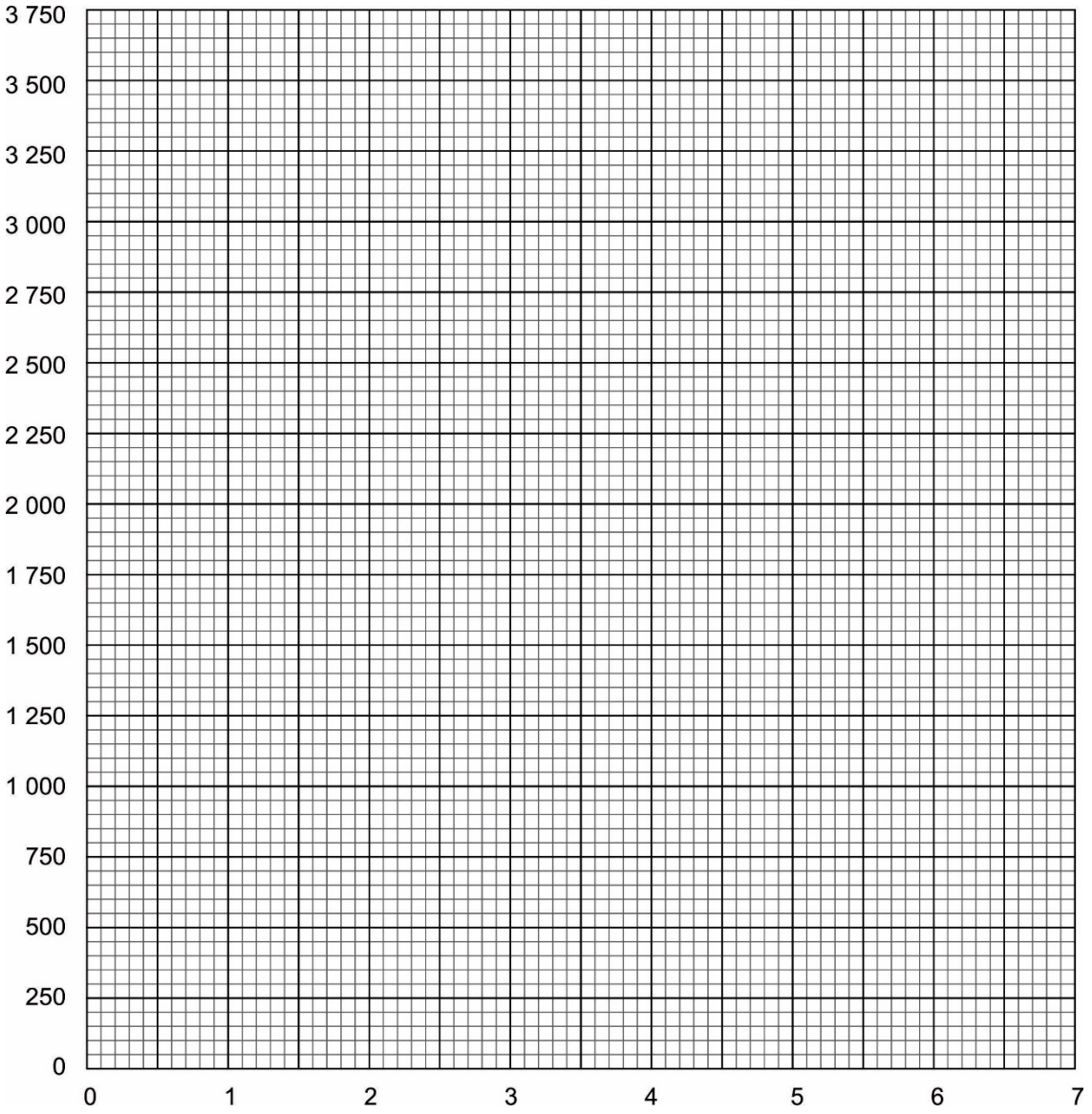
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2.3.2 Complete the table below that represents the number of people who share the cost of the 6-sleeper chalet per night, in peak season.

Number of people staying in the chalet	1	2	3	4	5	6
Cost of the chalet per night (R)	3 432					

(4)

2.3.3 Use the information you calculated in the table above to draw a suitable graph to represent the cost of the chalet per night based on how many people share the cost.



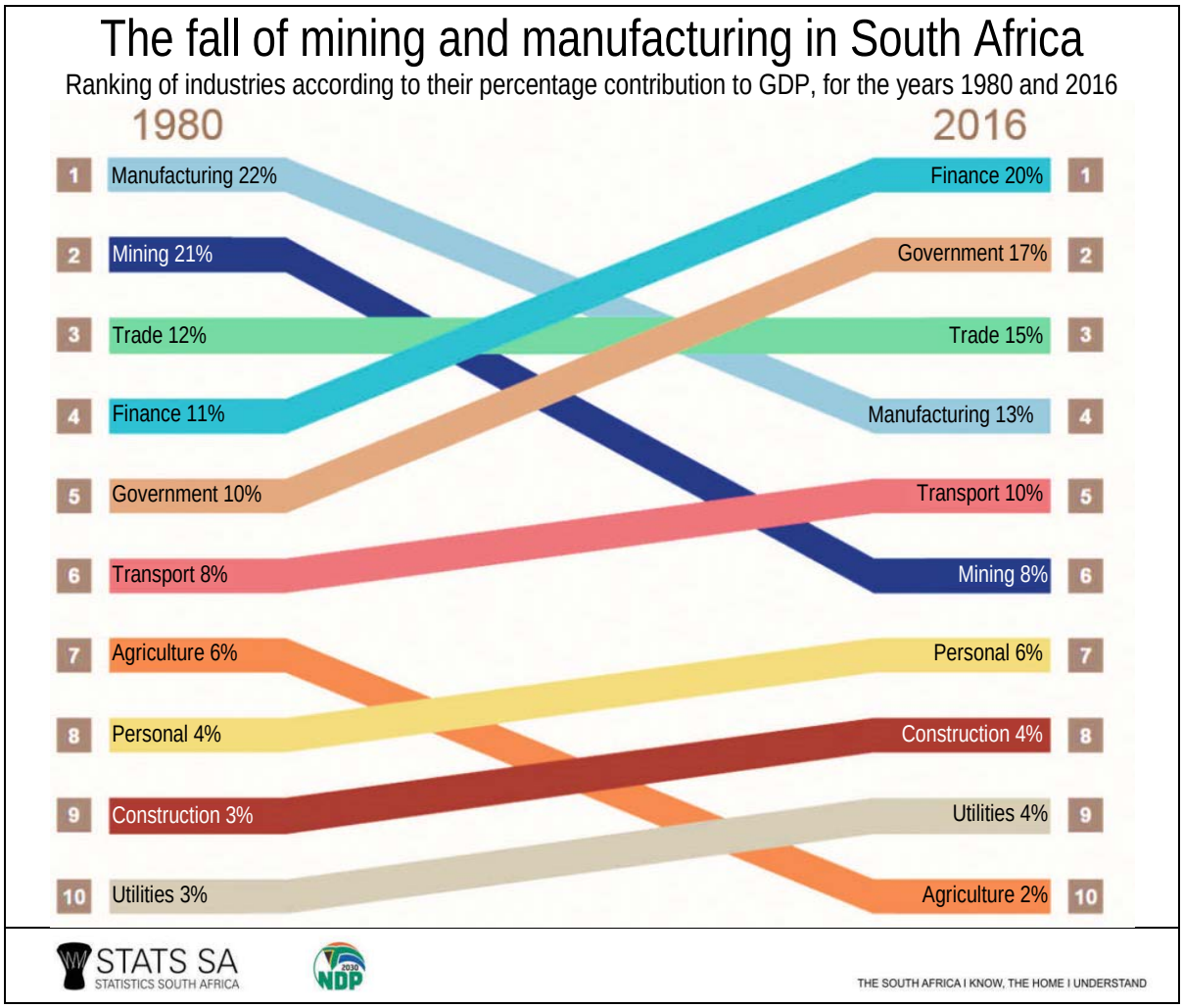
(7)
[31]

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QUESTION 3

Mining is a big source of income for the South African Government. Use the information below to answer the questions that follow:

3.1



3.1.1 There are two industries that increased and decreased by the same large amount. Name these:

Industry that increased: _____

Industry that decreased: _____

Percentage that they both changed by: _____% (3)

3.1.2 Explain why there must be an error in one of the industries that contributed to the GDP in 2016.

_____

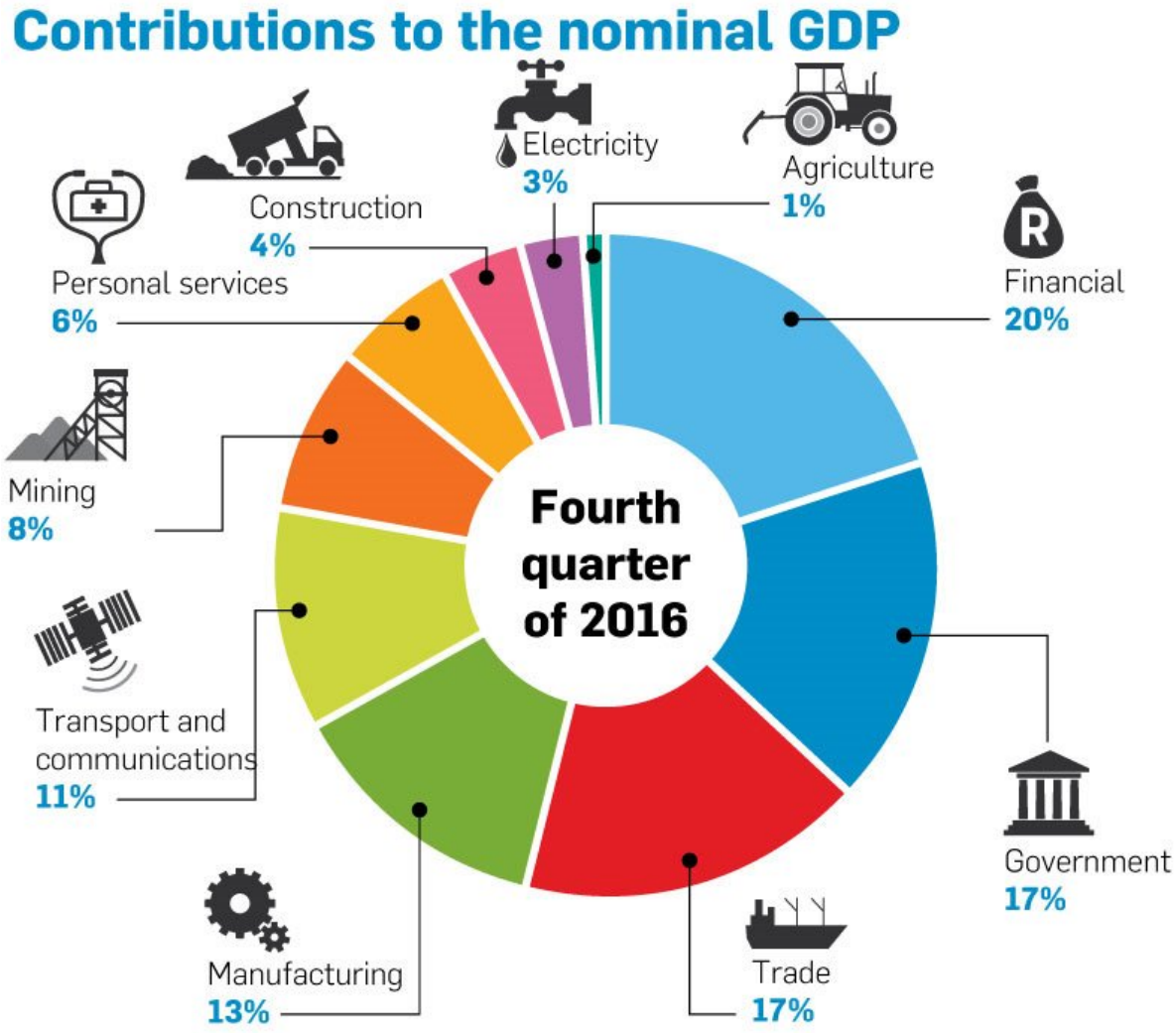
_____

_____

_____

(3)

3.2 Below is a pie chart that shows the percentage contributions of each of the categories for the fourth quarter of 2016.



[THEUNS KRUGER, Graphics24]

3.2.1 From which month to which month of the year is this pie chart referring to?

_____

_____

(2)

3.2.2 State at least three differences between the information in this pie chart and the information for 2016 in the graph on the previous page.

_____

_____

_____

_____

(3)

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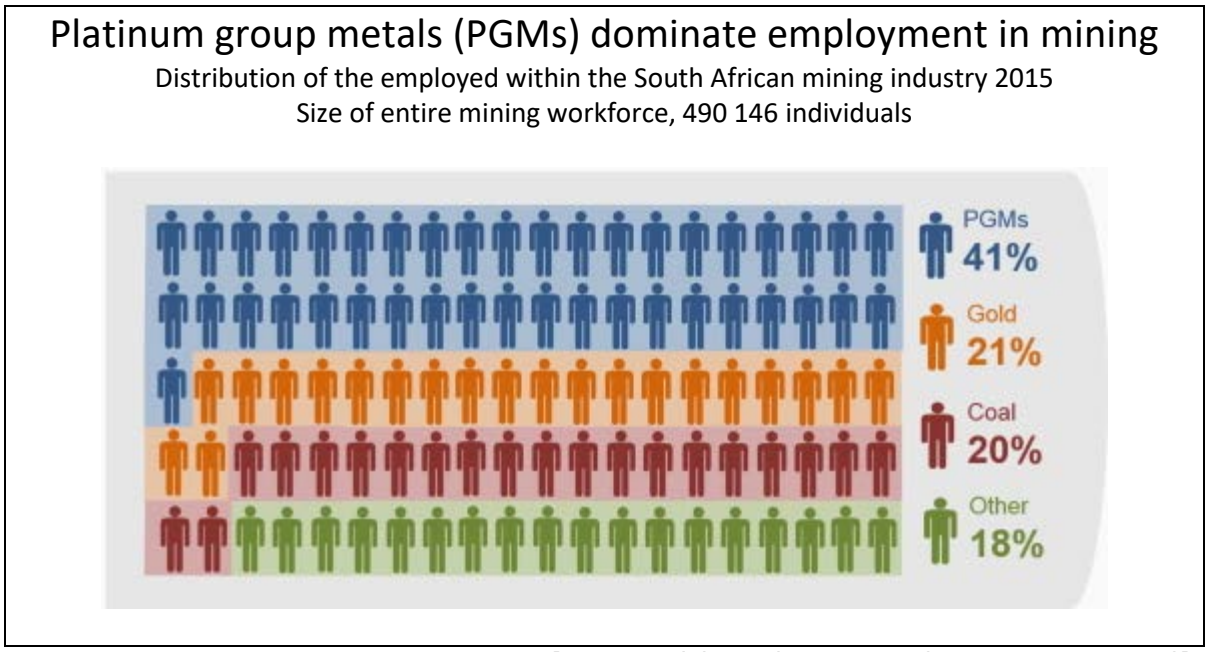
3.2.3 Bobby was asked to calculate the size of the angle for Government on the pie chart. He did the following calculation:

$$\frac{17}{360} \times 100$$
$$= 4,72\dot{2}$$
$$\approx 4,8°$$

State three errors that Bobby made and show the correct calculation below:

(5)

3.3 Due to the mining sector being such a big contributor to the GDP, it makes sense that there would be a large number of employment opportunities. Use the pictograph below to answer the following questions:



[Source: Mining Industry, 2015 (Report No. 20-01-02)]

3.3.1 Calculate how many individuals one of the little men in the graph represents.

(3)

3.3.2 The year before this, the platinum group metals employed 37% of the mining workforce. Calculate the percentage increase between the two years.

(4)

3.4 A survey was conducted on a random sample of employees in the PGM group. Twenty people from three different departments were asked how many children they had. The results for each department are recorded below:

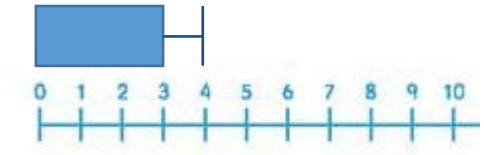
Department A

3	2	1	1	0
3	2	2	2	1
2	2	0	0	4
1	2	1	1	5

Department B



Department C



3.4.1 State the maximum number of children an employee from Department B has and briefly discuss how this compares to the rest of the data from Department B.

(2)

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3.4.2 By referring to all the data from across the three departments, calculate the range.

(3)

3.4.3 Compare the data for Department B and C by referring to the interquartile range of each.

(3)

3.4.4 Department C does not have a whisker on one side of the box. Explain why this is possible.

(3)

3.4.5 How many children does an employee from Department C have if they lie on the 75^{th} percentile?

(2)

3.4.6 If an employee was chosen at random from Department A, what would the probability be that they would have only one child?

(2)

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3.4.7 One in every three of the children in Department A is a girl. If an employee was chosen at random from Department A, calculate the probability that it would be an employee that has one child who is a girl.

(4)
[42]

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QUESTION 4

4.1 Mrs Khumalo is 66 years old. She earns R180 per hour and works eight hours a day from Monday to Friday.

4.1.1 This month, which had four weeks in it, she had to work an extra six hours on two Saturdays for which she got paid time and a half.

Show by means of calculation that her gross salary for this month is R32 040.

(6)

4.1.2 Determine Mrs Khumalo's annual taxable income if she earns R32 040 per month.

(2)

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4.1.3 Using the income tax tables below, calculate Mrs Khumalo's annual income tax.

2019 tax year (1 March 2018 – 28 February 2019)

Taxable income (R)	Rates of tax (R)
1 – 195 850	18% of taxable income
195 851 – 305 850	35 253 + 26% of taxable income above 195 850
305 851 – 423 300	63 853 + 31% of taxable income above 305 850
423 301 – 555 600	100 263 + 36% of taxable income above 423 300
555 601 – 708 310	147 891 + 39% of taxable income above 555 600
708 311 – 1 500 000	207 448 + 41% of taxable income above 708 310
1 500 001 and above	532 041 + 45% of taxable income above 1 500 000

Tax Rebate	
Primary	R13 635
Secondary (65 and older)	R7 479
Tertiary (75 and older)	R2 493

[Source: <www.sars.gov.za>]

(6)

4.1.4 Calculate Mrs Khumalo's nett monthly salary.

(3)

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4.2 The Khumalos need a new fridge. They see the following advertisement:

KIC 238LT Metallic Bottom Freezer Fridge



Now
R4 399,00

From only
R295 pm × 30 months
Deposit R439 • Credit Price R8 850

[Source: <www.russells.co.za>]

4.2.1 If they purchased the fridge using *hire purchase*, how many years would it take them to pay off the fridge?

(2)

4.2.2 The advertisement states that the credit price is R8 850. Is this amount the total amount that they would pay for the fridge? Justify your answer.

(3)

4.2.3 By comparing the cash price to the credit price, calculate the interest that was charged for the hire purchase agreement.

(3)
[25]

Total: 150 marks

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