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TOTAL MARKS

MATHEMATICAL LITERACY: PAPER I

EXAMINATION NUMBER

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. This question paper consists of:
   - 20 pages that include 1 page at the back for extra calculations or rough work
   - 5 questions

2. Please check that your question paper is complete.

3. Answer ALL FIVE questions.

4. Answer the questions in the space provided on this paper and hand it in at the end of the examination session.

5. A non-graphical, non-programmable calculator may be used.

6. ALL necessary calculations must be clearly shown.

7. Units of measurement must be included where applicable.

8. It is in your own interest to write legibly and to present your work neatly.

9. Maps and diagrams are not necessarily drawn to scale.

10. ONE blank page (page 20) is included at the end of the question paper. If you run out of space for a question, use this page. Clearly indicate the question number of your answer should you use this extra space.

Question	1		2		3		4		5		Total	
	Marker	Mod.	Marker	Mod.	Marker	Mod.	Mod.	Mod.	Marker	Mod.	Marker	Mod.
Mark												
Signature												
Total	35		27		27		37		24		150	

QUESTION 1

Philip lives in Sandton, South Africa, and often travels for work.

1.1   Philip flies out from O.R. Tambo International Airport and needs to park his car at the airport. The parkade at the airport is managed by Airport Company who charges the following rates:

PARKING TIME PERIOD	PARKING TARIFF
0 – 1 hour	R32
1 – 2 hours	R40
2 – 3 hours	R45
3 – 4 hours	R64
4 – 12 hours	R164
12 – 24 hours (1 day)	R180
Thereafter R90 for every 12 hours or part thereof	

Use the table above to answer the questions that follow:

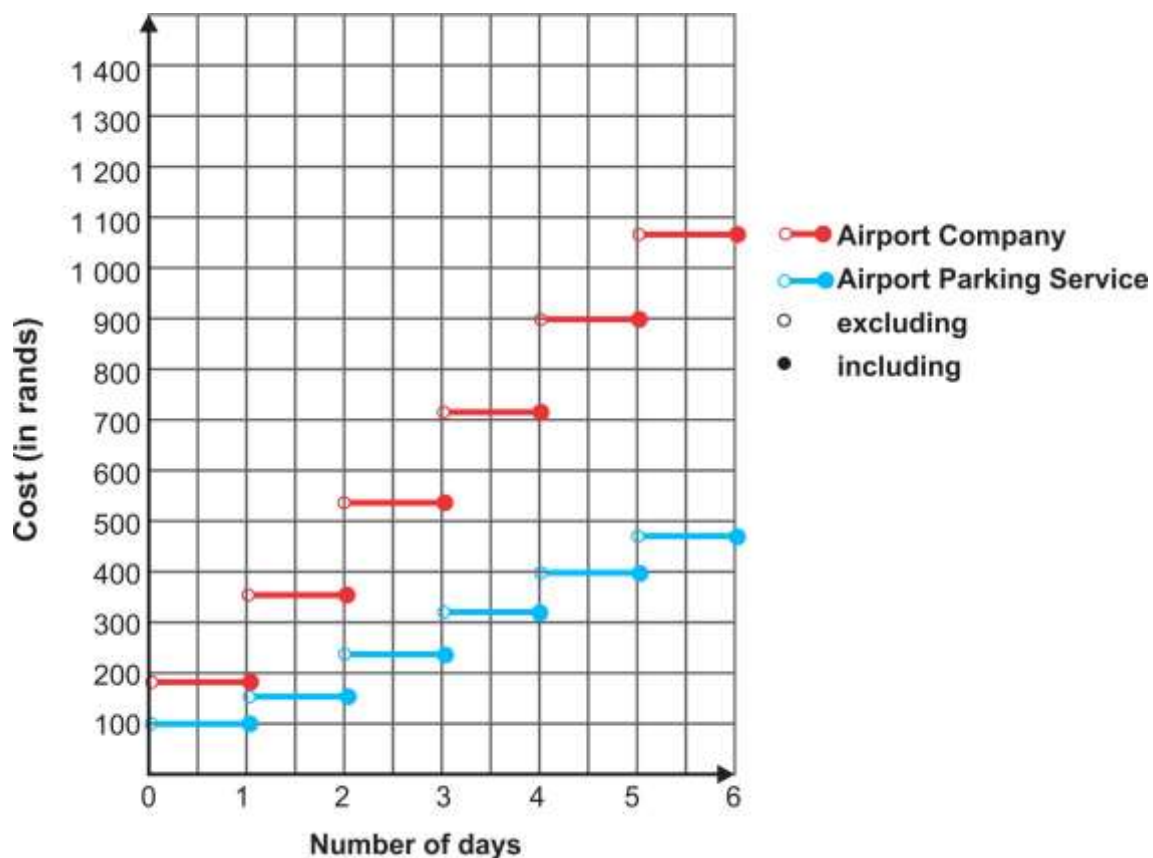1.1.1   Determine the cost for parking if Philip parked his car at the airport for 14 hours.

(2)

1.1.2   Determine the cost per hour for the 14 hours.

(2)

1.1.3   Calculate the total cost for parking if Philip parked his car at the airport for three days.

(4)

1.1.4 Another company, Airport Parking Service, offers parking close to the airport. Philip considers leaving his car with them and does a price comparison. He illustrates his findings graphically, as shown below:

Use the graph to answer the questions that follow:

(a)   Determine the cost for parking if Philip parked his car for two days and used Airport Parking Service.

_____

_____

(2)

(b)   Philip needs to park his car for 4½ days.

    (i)   Calculate how much Philip will save if he uses Airport Parking Service instead of Airport Company.

    _____

    _____

    (3)

    (ii)   Calculate this saving as a percentage.

    _____

    _____

    (3)

1.2   While waiting for his flight, Philip ordered a cappuccino and a croissant.

His till slip for the order is shown below:

★

MUGG & BEAN

GIVING YOU MORE AND MORE

O. R. Tambo International Airport   Shop DF15
011 390 3386

CASHIER: Asanda

Easy Cappuccino   R32,90
Butter Croissant   R44,90

TOTAL DUE   R77,80
Elect Payment   R77,80

Rate   **VAT**   **Total**
15%   **B**   **A**

You were served by Daphne.
12:45:18   15-10-2020

[Resource: <www.mugandbean.co.za>]

Use the till slip to answer the questions that follow:

1.2.1   State the name of the restaurant that Philip ordered from.

_____

_____
(2)

1.2.2   State the month in which this till slip was issued.

_____

_____
(2)

1.2.3   Calculate the missing values **A** (the total excluding VAT) and **B** (the amount
of VAT charged).

_____

_____
(5)

    1.2.4 If the price of a butter croissant increases by 5,2% each year for the next two years, calculate the price of a butter croissant in 2022.

_____

_____

_____

(3)

1.3 Philip and his business partner had to fly to Amsterdam, the capital of the Netherlands. The details of Philip's flight are shown below:

Use the information alongside to answer the questions that follow.

1.3.1 Calculate the total flight cost for both tickets.

_____

_____

(2)

    1.3.2 If Philip booked the same tickets in Amsterdam, he would have paid a total of €1 449,41 for both tickets. Calculate the exchange rate at the time the tickets were bought, in the form of €1 = R. _____.

_____

_____

(3)

1.3.3 Travelex (a foreign exchange company) sells €1 for R19,7231 and buys €1 for R18,9599. Calculate, in rands, the profit they are making on €1.

_____

_____

(2)
[35]

QUESTION 2

Rudo and Shalome are on holiday in South Africa and were invited to a "Bring and Braai" with friends. Not knowing what a braai was, they did some research and learnt that the word **braai** is Afrikaans for "**barbecue**" or "roast" and that it is a social custom in South Africa, Namibia, Zimbabwe and Zambia.

2.1   The charcoal used for roasting (braaiing) the meat burns at 2 000 °F.

     2.1.1 By selecting the correct formula, convert 2 000 °F to degrees Celsius.

$$°F = \frac{8}{5}\ °C + 32 \quad OR \quad °C = \frac{5}{9}\left(°F - 32\right)$$

                                                   (3)

     2.1.2 It is recommended that to cook a medium steak, one must roast (braai) it for five minutes per side.

        (a)   Determine how long it will take to cook a medium steak.

                                                   (2)

        (b)   If the steak is placed on the fire at 13:57, at what time will the steak be ready?

                                                  (2)

2.2 Rudo really enjoyed the steak prepared on the braai and asked about the spice mix used to flavour the meat. He was given the following recipe.

TAILOR-MADE BRAAI SALT by Jan Braai | Published October 20, 2013
WHAT YOU NEED
RECIPE FOR BRAAI SPICE (makes ½ cup)

- 1 tot* salt
- ½ tot ground black pepper
- ½ tot paprika
- ½ tot crushed garlic powder
- ½ tot ground coriander
- 1 tsp cayenne pepper (or chilli powder)
- 1 tsp ground cumin
- 1 tsp ground cloves
- 1 tsp ground nutmeg
- 1 tsp ground allspice (pimento)

Put all the ingredients in a glass jar, then close the lid and shake it well. Use as needed to season steak, chops or chicken. The salt mix also works very well as a dry rub on large meat cuts like beef brisket or pork belly.

* tot: a measure for strong alcohol like whisky and brandy.
One tot measures 25 grams and one teaspoon measures 4,2 grams.

Use the above information to answer the questions that follow.

2.2.1 Determine how many grams of braai spice this recipe makes in total if one cup of dry ingredients weighs 220 grams.

(2)

2.2.2 If one cup of dry ingredients weighs 220 grams or 7,75 ounces, calculate how many grams there are per ounce.

(2)

2.2.3 Write the quantities of coriander to cayenne pepper in simplest ratio form. (Hint: first convert the quantities to grams)

(4)

2.3   "Braaibroodjies" (toasted sandwiches) are delicious additions to any braai. Each square slice of bread has the following dimensions: 11 cm × 11 cm × 1,5 cm thick.

Note: two square slices of bread makes one square sandwich.
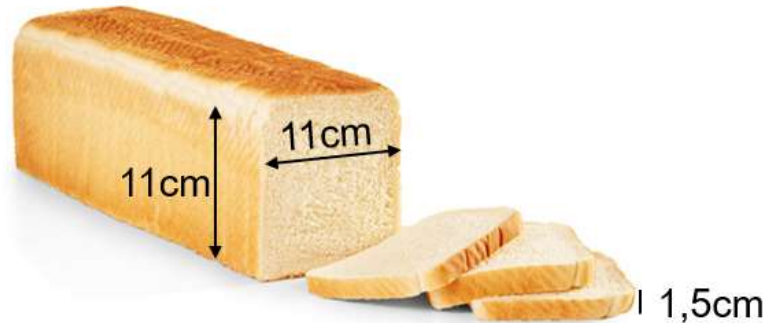
Use the information above to answer the questions that follow.

2.3.1   An average loaf of bread is 11,81 inches long. If 1" (inch) = 2,54 cm, determine the length of a loaf of bread, rounded off to the nearest centimetre.

_____

_____
                                                                                                    (3)

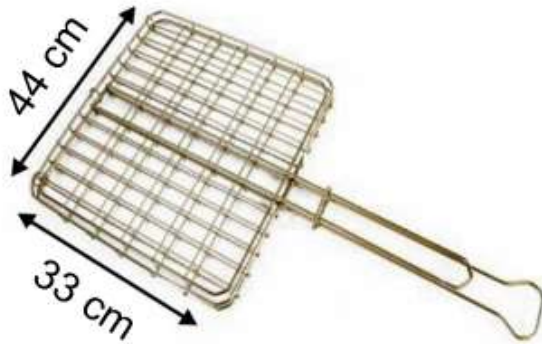2.3.2   Using your answer above, calculate how many slices of bread can be cut from one loaf of bread.

_____

_____
                                                                                                    (2)

2.3.3   If the two end slices (the crusts) are not used, how many toasted sandwiches can be made with one loaf of bread?

_____

_____
                                                                                                    (3)

2.3.4 "Braaibroodjies" can be grilled on the fire in a braai grid as seen below:

Picture of the braai grid   Picture of sandwiches placed in the grid


If the sandwiches are packed tightly on the grid without placing them on top of each other, determine the maximum number of sandwiches that can be packed in the grid.

_____

_____

(4)
[27]

QUESTION 3

Pilgrim's Rest is a small museum town in Mpumalanga, South Africa, which is protected as a provincial heritage* site. It was the second of the Transvaal gold fields, attracting a rush of prospectors in 1873, soon after the MacMac diggings started some five kilometres (3,1 miles) away.

*heritage: of architectural and historic value that is preserved for the nation
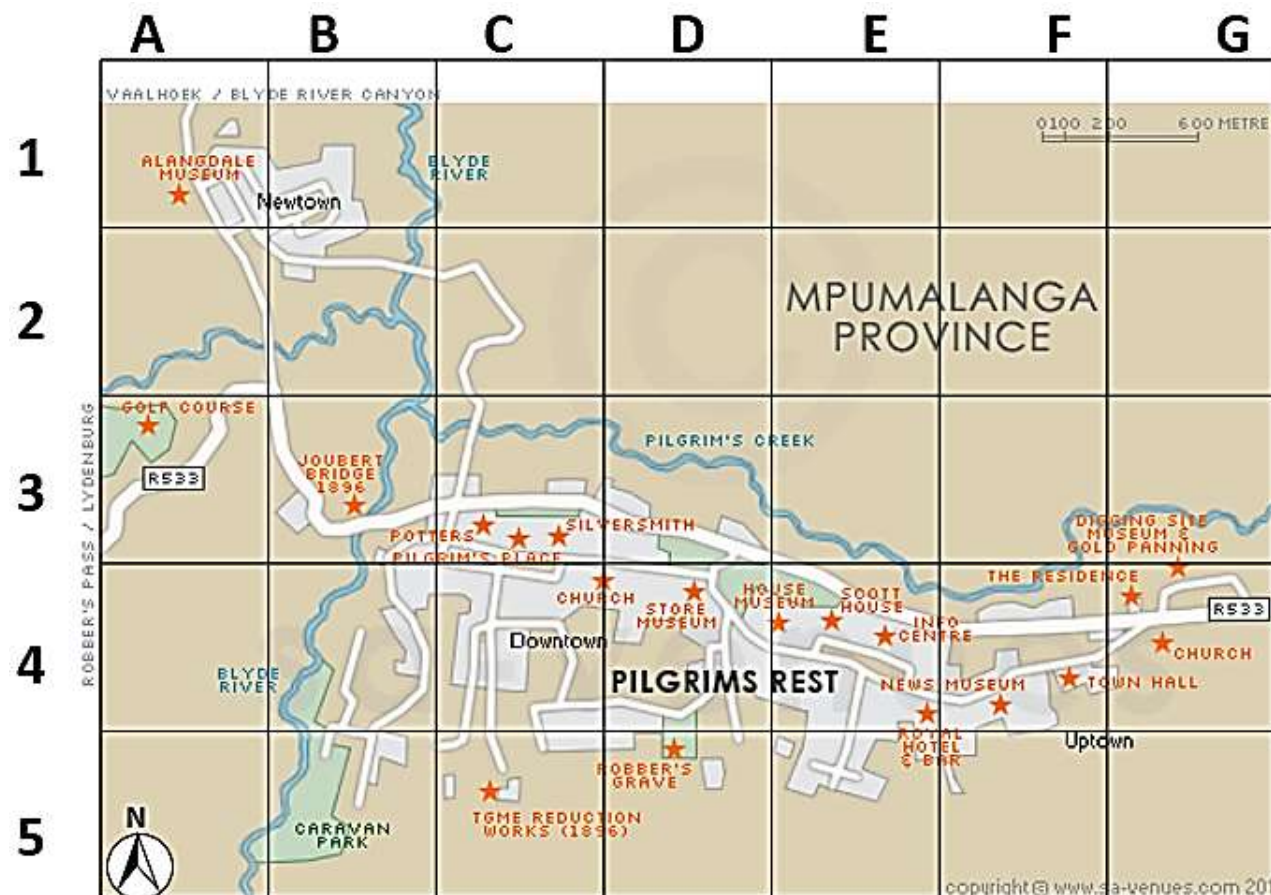
3.1   Use the map above to answer the questions that follow:

    3.1.1   Give the grid reference of Joubert Bridge.

_____

(2)

    3.1.2   By making use of the bar scale, calculate the area of B5 in m².

_____

_____

_____

_____

(5)

3.1.3 Name the tourist attraction, indicated by a star, that lies south of the Store Museum (D4).

_____

_____

(2)

3.2 Pilgrim's Rest covers a total of 25,4 km² and is home to 1 721 people. Determine the number of people per km².

_____

_____

(2)

3.3 The name of Mpumalanga's capital city, Nelspruit, was changed to Mbombela in 2009. However, most maps available online remain outdated. Siphokuhle found the following outdated map of Mpumalanga on www.roomsforafrica.com:

3.3.1 Name two places of interest an animal lover can visit in Mpumalanga, as shown in the map.

_____

(2)

3.3.2 The Free State lies to the _____ of Mpumalanga.   (2)

3.3.3 Name the two neighbouring countries on the border of Mpumalanga.

_____

(2)

3.3.4 According to this map, on which national road would one travel to get from Middelburg to Nelspruit?

_____

(2)

3.3.5 The actual distance, as the crow flies, from Middelburg to Ermelo is 108 km and it measures 3,6 cm on the map. Determine the scale of this map.

_____

_____

_____

(3)

3.3.6 Thandi left Middelburg at 2 pm to drive to Ermelo. The distance between these two towns is 108 km and she travelled at a speed of 81 km/h. Determine, using analogue time format, the time Thandi will arrive at Ermelo. Assume no stops were made.

_____

_____

_____

(5)
[27]

QUESTION 4

The World Wrestling Entertainment, Inc., WWE, is an American integrated media and entertainment company that is primarily known for professional wrestling.

WWE LIVE was expected to return to South Africa in 2020 with events in Cape Town, Durban and Johannesburg. Famous WWE wrestlers Seth Rollins and Becky Lynch were among those expected to have appeared.

4.1   The WWE's 10 highest-paid wrestlers in 2017 are shown in the graph below:
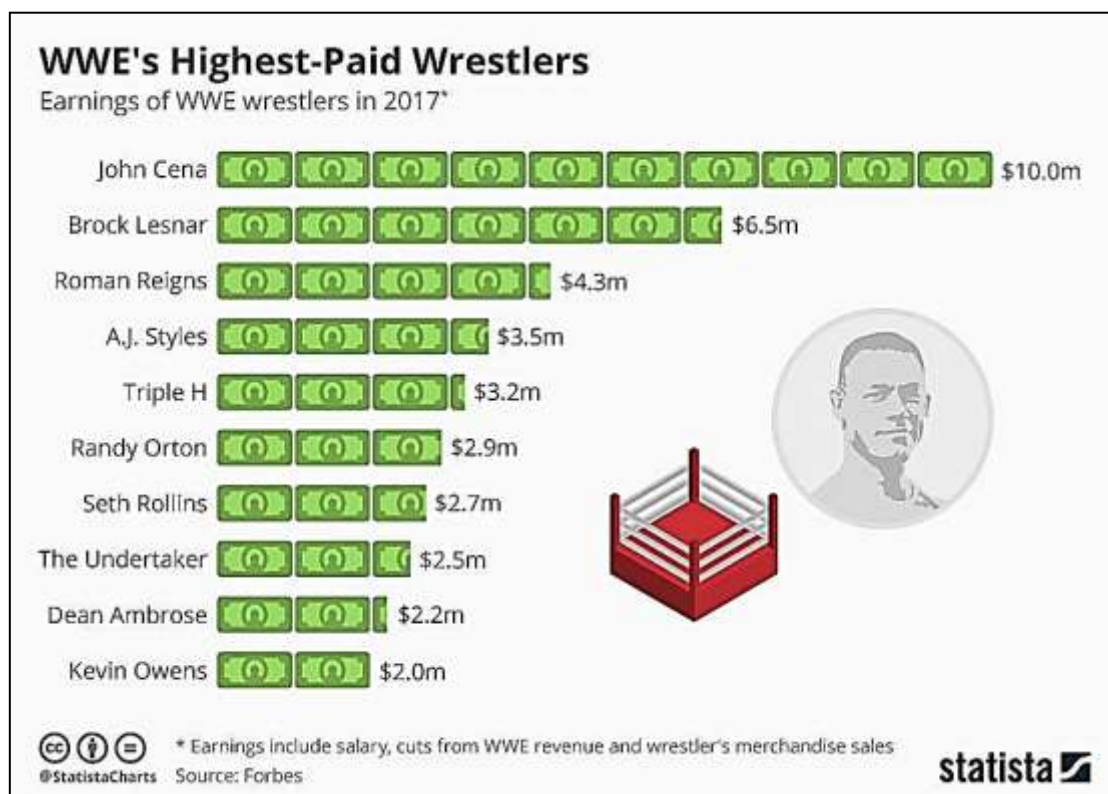
Use the above graph to answer the questions that follow.

4.1.1 Name the type of graph represented above.

                                                                                                    (2)

4.1.2 State the value of a single green note ().

                                                                                                    (2)

4.1.3   Determine the range in earnings of the top 10 WWE wrestlers.

_____

_____

(2)

4.1.4   Calculate the mean (average) earnings of the top 10 WWE wrestlers. Write your answer in number format without using the word million.

_____

_____

(4)

4.1.5   Calculate the median earnings of the top 10 WWE wrestlers.

_____

_____

(3)

4.1.6   (a)   The box-and-whisker plot below illustrates the top 10 WWE wrestlers' earning. The lower quartile is $2,5 million.
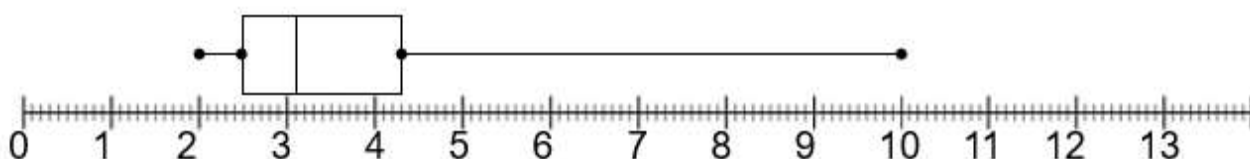
Use the box-and-whisker plot to answer the following questions:

(i)   Write down the value of the upper quartile.

_____

(2)

(ii)   Calculate the interquartile range.

_____

(2)

(iii)   Determine how many wrestlers' earnings fall between the lower and upper quartiles.

_____

(2)

(b)   Select the correct statement(s) to describe the upper quartile of the data. Tick the chosen statement(s).
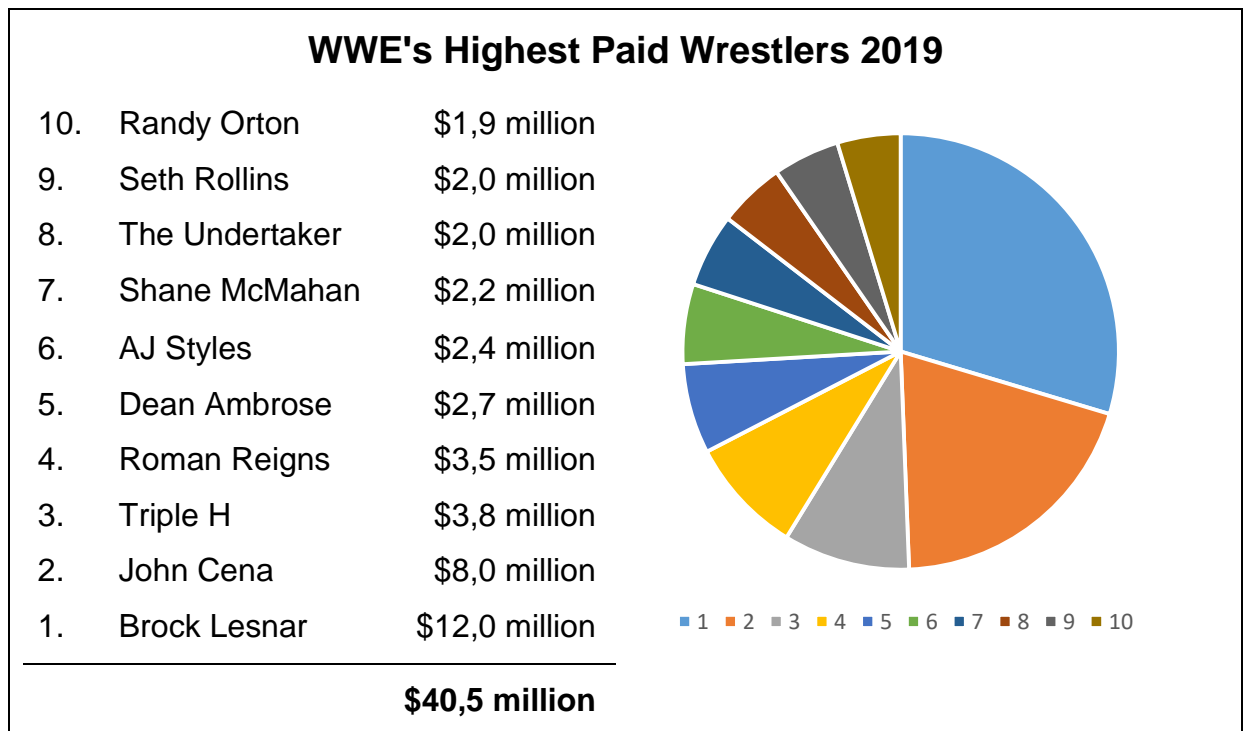
☐   The data is skewed to the left.

☐   The upper quartile represents the top 25% earners.

☐   The difference in earnings for the upper quartile is larger than the difference for the lower quartile.

(2)

4.2   The pie chart below shows the WWE's highest-paid wrestlers in 2019.

WWE's Highest Paid Wrestlers 2019

10.	Randy Orton	$1,9 million
9.	Seth Rollins	$2,0 million
8.	The Undertaker	$2,0 million
7.	Shane McMahan	$2,2 million
6.	AJ Styles	$2,4 million
5.	Dean Ambrose	$2,7 million
4.	Roman Reigns	$3,5 million
3.	Triple H	$3,8 million
2.	John Cena	$8,0 million
1.	Brock Lesnar	$12,0 million

$40,5 million

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ 10

4.2.1   Write down the maximum amount earned by a wrestler in 2019.

(2)

4.2.2   State the modal earnings in 2019.

(2)

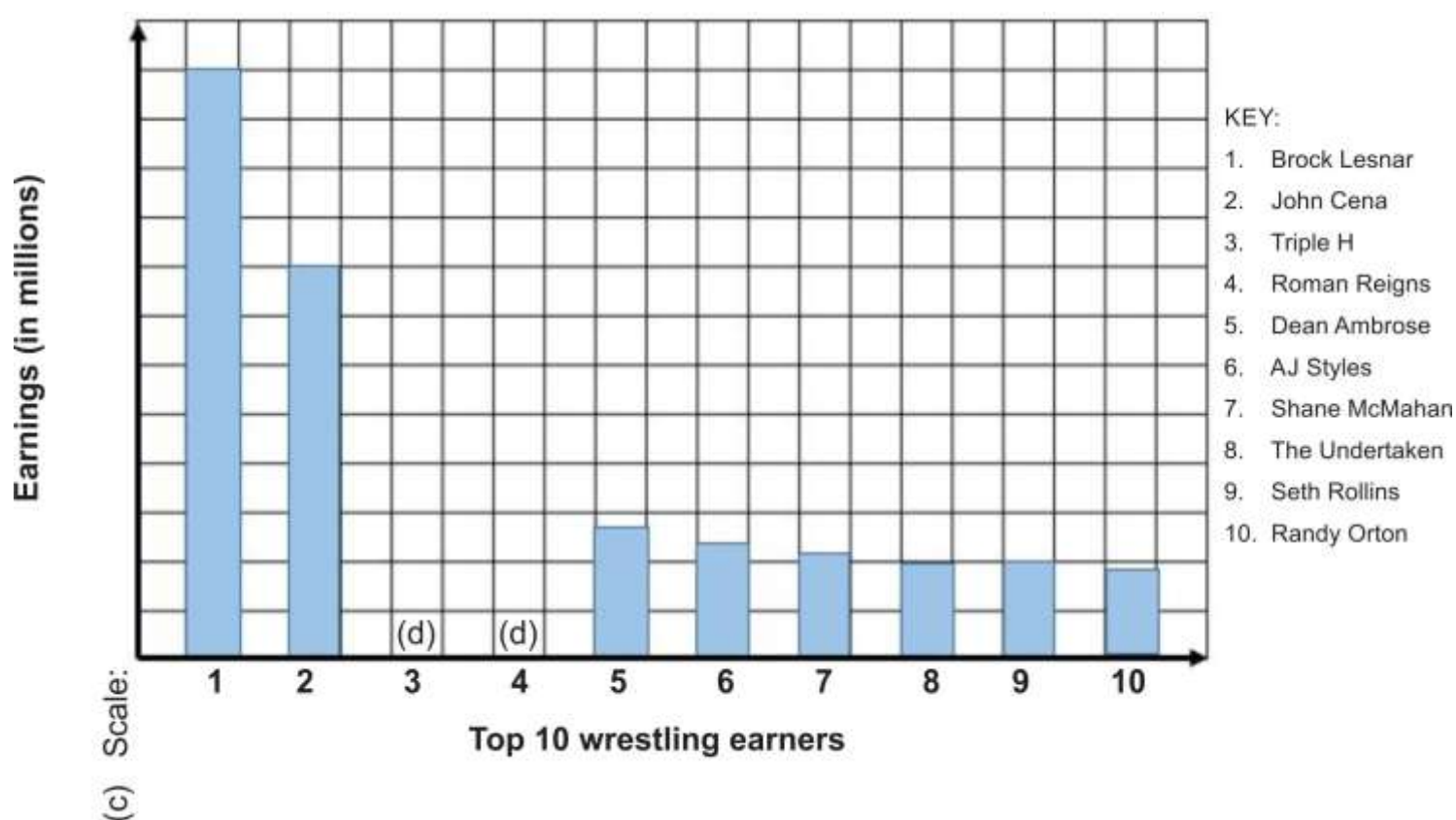4.2.3 (a)   Calculate Brock Lesnar's earnings as a percentage of the total earnings.

(3)

(b)   Hence, calculate the size (in degrees) of the sector in Question 4.2.3 (a) of the pie chart.

_____

_____
(2)

4.2.4 Below is a bar graph depicting the top 10 highest-paid WWE wrestlers in 2019 with certain information omitted.

(b)   Suitable heading:

_____

KEY:
1. Brock Lesnar
2. John Cena
3. Triple H
4. Roman Reigns
5. Dean Ambrose
6. AJ Styles
7. Shane McMahan
8. The Undertaken
9. Seth Rollins
10. Randy Orton

Earnings (in millions)

Top 10 wrestling earners

(c) Scale:

Use the above graph to answer the questions which follow:

(a)   Is the data represented in the graph numerical or categorical?

_____
(2)

Complete questions **(b)–(d)** in the relevant spaces on the graph:

(b)   Provide a suitable heading for the graph.

(c)   Provide a suitable scale for the graph.

(d)   Sketch the bars for Triple H and Roman Reigns.   (5)
[37]

QUESTION 5

Lerato has an important meeting scheduled with her employers to discuss a possible salary increase.

5.1 While getting ready for the meeting, Lerato is undecided as to what she is going to wear. She must choose between three different coloured pants (black, grey and brown) and two different coloured blouses (red and green).

Complete the answers for **A**, **B** and **C** on the tree diagram below to complete the possible combinations she can choose from.
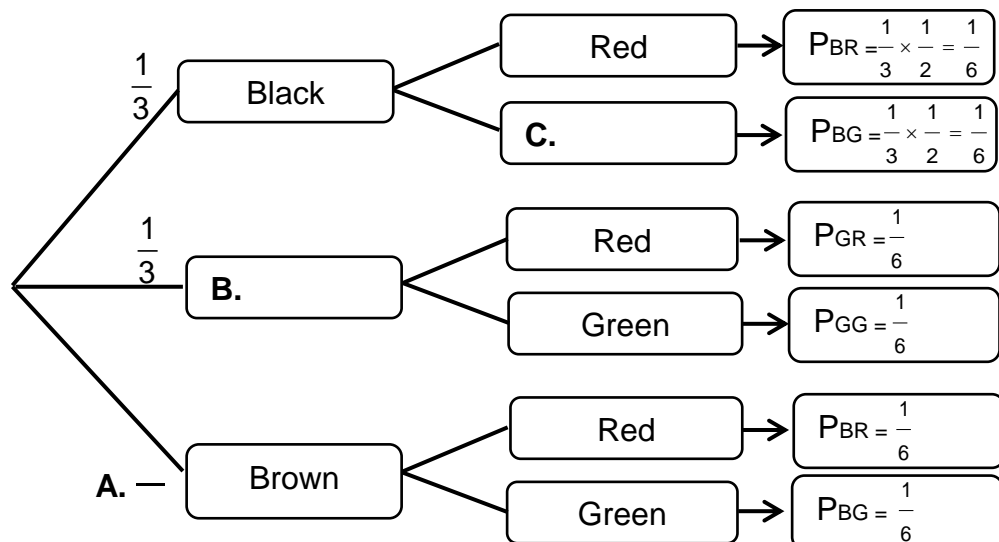

Calculate the probability that Lerato would wear black pants, a green blouse and black boots if the probability of her choosing black boots is 0,35.

_____

_____

(5)

5.2 When arriving at the meeting, Lerato notices that the board room has three blue chairs, two red chairs and four brown chairs. A co-worker was already seated in one of the brown chairs. Determine the probability that Lerato would also select a brown chair to sit on. Write your answer as a fraction.

_____

_____

(2)

5.3   During the meeting, Lerato was offered a sandwich. The sandwich was cut diagonally into two triangles as illustrated below.
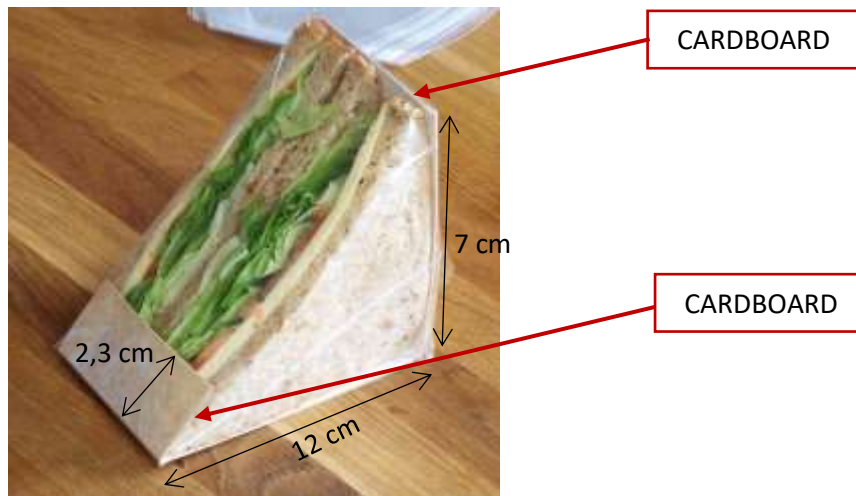
5.3.1   The sandwich was served on a folded piece of cardboard as seen in the picture above. Calculate the total length of the piece of cardboard.

_____

_____

(2)

5.3.2   The sandwich has a triangular label that is not visible in the picture above but is illustrated alongside. Calculate the area of the label.

You may use the following formula:

Area = $\frac{1}{2}$ base × perpendicular height.

_____

_____

(2)

5.4   Lerato receives a salary increase and will receive a monthly taxable income of R20 800.

5.4.1   Calculate Lerato's annual taxable income if she earns a bonus, which is equivalent to her monthly taxable income, in December.

_____

_____

(3)

5.4.2 Lerato calculated her annual tax, before rebates were deducted, using the extract from the tax table below:

	RATES OF TAX FOR INDIVIDUALS	
	2021 Tax Year (1 March 2020 – 28 February 2021)	
TAX BRACKET	TAXABLE INCOME (in Rand)	RATES OF TAX (in Rand)
2	205 901–321 600	37 062 + 26% of taxable income above 205 900

[Resource: <www.sars.gov.za/Tax-Rates/Income-Tax>]

Fill in the missing values A, B and C in Lerato's calculation.

R37 062 + 26% (**A** _____ – R205 900)

= R37 062 + 26% (**B** _____)

= **C** _____ (3)

5.5 Lerato applies for a personal loan of R23 000. She is charged 24,75% simple interest per year and will repay the loan over two years in equal monthly instalments.

5.5.1 Calculate the amount of interest Lerato is charged.

(3)

5.5.2 Calculate the total amount of Lerato's loan.

(2)

5.5.3 Calculate Lerato's total monthly repayment amount.

(2)

[24]

Total: 150 marks

ADDITIONAL SPACE TO ANSWER QUESTIONS. REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE ALL ANSWERS ARE MARKED.