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exam revision

Mathematical Literacy
Topic 1: Mixed Questions

**Question 1**
Guylain borrows R15 000 from his friend, Molefe, to finish an order for his customers. Molefe offers the following two options of repayment after one year:

A: The loan plus 12% p.a. interest compounded half-yearly

B: The loan plus 12% simple interest per annum

1.1 Calculate the amount Guylain has to repay according to option A, using the following formula: \( A = P(1 + i)^n \)
where:
- \( A \) = the final amount
- \( P \) = the amount borrowed
- \( i \) = the interest rate and
- \( n \) = the period

1.2 Calculate the amount Guylain has to repay according to option B, using the following formula: \( A = P(1 + i)^n \)

1.3 Which of the two options would Guylain prefer? Why?

1.4 Which of the two options would Molefe prefer? Why?

**Question 2**
Mr Ndlovu uses the below graph to illustrate the number of days it would take a number of workers to build a wall.
Use the graph to answer the following questions:

2.1 How many days would it take for the wall to be built by only 1 worker? (1)
2.2 Estimate how many days it would take for the wall to be built by only 6 workers. (2)
2.3 Calculate the minimum number of workers Mr Ndlovu should employ to build the wall:
   (a) In exactly 5 days (2)
   (b) In exactly 8 days (3)

**Question 3**

Shaya FC plays two matches in March. There are three possible outcomes for each match: win (W), lose (L) or draw (D). A tree diagram is drawn to work out the possible outcomes for the two matches.

![Tree Diagram](image)

3.1 Complete the tree diagram above to show all the possible outcomes of the two matches. (4)
3.2 Use the completed tree diagram to predict the probability that Shaya FC will:
   (a) Win both matches (2)
   (b) Win only one of the matches (2)
   (c) Draw at least one of the matches (3)
**Question 4**

Yusuf Khan is a property developer who has bought a large piece of land on which he wants to build houses to rent to tenants. He surveyed a representative sample of the rented houses in the area in order to find out how many people live in each house. He obtained the following results:

**Number of people living in each house surveyed**

<table>
<thead>
<tr>
<th>Single-member households</th>
<th>Multiple-member households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>723</td>
<td>219</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>534</td>
<td>427</td>
</tr>
<tr>
<td>298</td>
<td>291</td>
</tr>
<tr>
<td>4</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

4.1 How many houses did Mr Khan survey?  

4.2

(a) What is the probability of randomly choosing a house in the area that has two or fewer people living in it?  

(b) Is there a greater probability of randomly choosing a house that has two or less people living in it, or randomly choosing a house that has more than two people living in it? Show ALL your workings.

**Question 5**

The debating club has to transport 77 of its members to a debate that is to be held 20 km away from the school. The club has the option of hiring buses from Naidu’s Transport Company, or using minibuses from a taxi company.  

The taxi company charges R14,00 per head, as long as there are at least 10 passengers in the minibus. Each minibus can accommodate a maximum of 15 passengers.

5.1 Analyse the information and determine the minimum number of minibuses that would be needed to transport the 77 members of the debating club.  

5.2 Hence, name ONE possible way that the 77 members of the debating club can be divided among these minibuses.

**Question 6**

All the members of the debating club at Mount Frere High are in grades 10, 11 or 12. The number of learners belonging to the debating club is given in the table below:

**Number of members in the debating club**

<table>
<thead>
<tr>
<th></th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>33</td>
<td>77</td>
<td>0</td>
<td>110</td>
</tr>
<tr>
<td>Boys</td>
<td>132</td>
<td>0</td>
<td>60</td>
<td>192</td>
</tr>
<tr>
<td>TOTAL</td>
<td>165</td>
<td>77</td>
<td>60</td>
<td>302</td>
</tr>
</tbody>
</table>

Use TABLE to determine the probability of randomly choosing a member of the debating club who is:

6.1 A boy in grade 12  

6.2 A learner who is not in grade 10
**Topic 2: Space & Shape**

**Question 1**
A bus tyre has a diameter of 120 cm. The ratio of the diameter of a bus tyre to the diameter of a minibus tyre is 12:7.

Calculate the distance travelled by the minibus (rounded off to the nearest km) if the minibus's tyre rotated 1 862 times during the journey.

The following formulae may be used:

\[
\text{Circumference} = 2\pi r \quad \text{where } r = \text{radius and using } \pi = 3.14
\]

\[
\text{Number of rotations} = \frac{\text{Distance travelled}}{\text{Circumference of tyre}}
\] (6)

**Question 2**
Mosima’s LCD TV screen is a new slim model that is only 39.7 mm thick. The rectangular screen is 45 cm high and 60 cm wide. The TV stands on a round base with a diameter of 20 cm, that is 2 cm thick and is held up by a swivel that is 5 cm high, as shown in the diagram below.

Determine the volume \(\text{in cm}^3\) of the rectangular box that the TV will be delivered in if there is an allowance of 5 mm for all measurements to package the TV, as shown in the side view above.

Given the formula: \(\text{Volume} = \text{length} \times \text{breadth} \times \text{height}\) (5)
Question 3
An aquarium is a place where collections of fish and other aquatic animals are displayed. The fish are kept in open rectangular glass tanks. A water pump is used to circulate and refresh the water in the tanks.
An open-top fish tank has the following dimensions:
length = 2.5 m; breadth = 2 m; height = 1.5 m

3.1 Determine the volume of the fish tank in kilolitres if \(1 \text{ m}^3 = 1 \text{ k}\ell\), where \(\text{volume} = \text{length} \times \text{breadth} \times \text{height}\). (3)

3.2 Determine the total surface area (in \(\text{m}^2\)) of glass used for the open-top fish tank, where \(\text{surface area} = (l \times b) + 2 \times (l \times h) + 2 \times (h \times b)\), (4)
and \(l = \text{length}\), \(b = \text{breadth}\) and \(h = \text{height}\). (3)

3.3 Calculate the cost of 20 \(\text{m}^2\) of special glass for the fish tank @ R480.00 per \(\text{m}^2\). (3)

3.4 The water pump costs R3 999.00. The suppliers gave the aquarium a 15% discount. Calculate how much the aquarium paid for the pump. (2)

3.5 The tank is filled with 6 900 \(\ell\) of water at a rate of 2 300 \(\ell\) of water per hour. Calculate the time taken to fill the tank.
Question 4

Gerrie van Niekerk is a primary school learner who lives in Krugersdorp. He lives on the corner of Wishart Street and 5th Street.

Refer to the map of part of Krugersdorp, Gauteng, above and use it to answer the following questions.

4.1 Give a grid reference for the Jays Shopping Centre where Gerrie and his mother do their weekly grocery shopping.

4.2 Gerrie’s grandmother lives with them and goes to the hospital for her medication once a month. What is the relative position of Krugersdorp Central Hospital with respect to Gerrie’s home?

4.3 Gerrie’s father drives from Jays Shopping Centre to the petrol station to buy petrol for his car. Describe his route if the exit from Jays Shopping Centre is in 4th Street.
5.4 Gerrie walks from home to Paardekraal Primary School by:
- Crossing 5th Street and walking in an easterly direction along Wishart Street
- Turning right and walking in a southerly direction along 4th Street
- Turning left and walking in an easterly direction along Onderste Street
- Turning right, and walking in a southerly direction along 3rd Street

The entrance to the school is on the corner of 3rd Street and Pretoria Street.
The distance on a map with a scale 1:11 000 is 11cm. Calculate the actual distance Gerrie walks to school. Give your answer in kilometres.

Interactive Q & A: Test yourself

Question
Calculate:
- 325 – 36,3 ÷ 0,3
- \( \frac{4}{5} \) of 250 learners
- 34% of 450 km

Answers
325 – 36,3 ÷ 0,3 = 325 - 121 = 204
\( \frac{4}{5} \) of 250 learners = 200 learners
34% of 450 km = \( \frac{34}{100} \times 450 \text{ km} = 153 \text{ km} \)

Question
If the soccer player takes a loan of R3 000 from a bank at a simple interest rate of 18% per annum, calculate the amount of interest that he would have to pay if he repays the loan over 1 year, using the formula:

\[
\text{Simple interest} = \frac{P \times n \times r}{100} \quad \text{or Simple interest} = P \times n \times i
\]

Where
- \( P \) = the initial amount
- \( n \) = time period
- \( r \) = interest rate and
- \( i = \frac{r}{100} \)

Answer
Simple Interest = \( P \times n \times r \)
= R3 000 \times 1 \times 0,18
= R540
Question
Convert 350 °F (degrees Fahrenheit) to °C (degrees Celsius) using the following formula: \( \text{Temperature in } ^\circ\text{C} = (\text{Temperature in } ^\circ\text{F} - 32^\circ) \times \frac{5}{9} \)

Round off the answer to the nearest 10°. (3)

Answer
\[
\text{Temperature in } ^\circ\text{C} = (350^\circ - 32^\circ) \times \frac{5}{9} = 176.666\ldots ^\circ\text{C} \\
\approx 180 ^\circ\text{C}
\]

Question
The aquarium charges an entrance fee.

<table>
<thead>
<tr>
<th>ENTRANT</th>
<th>ENTRANCE FEE PER INDIVIDUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>R 7,50</td>
</tr>
<tr>
<td>Pensioner</td>
<td>R 4,00</td>
</tr>
<tr>
<td>Children under 12 years</td>
<td>R 4,00</td>
</tr>
</tbody>
</table>

900 adults, 1 380 children under 12 years and 300 pensioners visited the aquarium during the first week of December 2007. Calculate the aquarium's income from entrance fees, for this week, using the formula below:

\[
\text{Income} = (\text{number of adults}) \times R 7,50 + (\text{number of children and pensioners}) \times R 4,00
\]

Answer
\[
\text{Income} = 900 \times R 7,50 + (1380 + 300) \times R 4,00 \\
= 900 \times R 7,50 + 1680 \times R 4,00 \\
= R 6750 + R 6720 \\
= R 13470
\]

Question
Convert 2.5 km to metres (1)

Answer
2.5 km = 2500 m
Question
The diagram below shows the floor plan of the living room of a house.

![Floor plan]

Calculate the perimeter of the living room.
Perimeter of rectangle = 2 \times (\text{length} + \text{breadth}) \hspace{1cm} (2)

Calculate the area of the floor
Area of rectangle = \text{length} \times \text{breadth} \hspace{1cm} (2)

Answer
- Perimeter = 2 \times (l + b)
  \quad = 2(5.2\text{m} + 3.8\text{m})
  \quad = 18\text{m}
- Area = l \times b
  \quad = 5.2\text{m} \times 3.8\text{m}
  \quad = 19.76\text{m}^2

Question
A circular flower bed has a radius of 1.5 metres.

Calculate
- the area of the flower bed if Area of circle = \pi \times r^2. \hspace{1cm} \text{Use } \pi = 3.14. \hspace{1cm} (3)
- the flower bed if Circumference of circle = 2 \times \pi \times r. \hspace{1cm} \text{Use } \pi = 3.14. \hspace{1cm} (3)
- Write down the diameter of the flower bed \hspace{1cm} (1)

Answer
- A = \pi r^2 = 3.14 \times (1.5\text{m})^2
  \quad = 7.065\text{m}^2
  \quad \approx 7.07\text{m}^2
- Circumference = 2 \times \pi \times r
  \quad = 2 \times 3.14 \times 1.5
  \quad = 9.42\text{m}
- 3\text{m}
Question
Sipho and Sandile recorded their times in minutes for a number of 7 km trial runs.

TABLE: Times taken for a 7 km trial run

<table>
<thead>
<tr>
<th>Sandile (in minutes)</th>
<th>35</th>
<th>32</th>
<th>31</th>
<th>32</th>
<th>31</th>
<th>30</th>
<th>29</th>
<th>32</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sipho (in minutes)</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>33</td>
<td>34</td>
<td>34</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

- Write down Sipho’s **median** time.  
- Calculate Sandile’s **median** time.  
- Determine the **range** of Sipho’s time.  
- Calculate Sandile’s **mean** time, rounded off to TWO decimal places.  
- Determine the **mode** of the times taken by Sandile.

Answer
- Median time = 34 minutes
- Sandile’s times: 29; 30; 30; 31; 31; 32; 32; 32; 32
  Median time = \( \frac{32 + 31}{2} \) minutes
  = 31,5 minutes or 31 minutes 30 seconds
- Range = (37 – 30) minutes
  = 7 minutes
- Sandile’s mean time
  Sum of Sandile’s times
  = \( \frac{29 + 30 + 30 + 31 + 31 + 32 + 32 + 32 + 35}{10} \) minutes
  = \( \frac{314}{10} \) minutes
  = 31,40 minutes OR 31 minutes 24 seconds
- Mode = 32 minutes
Topic 3: Solving Problems in Context

Question 1

TABLE below shows the area, the population, and the gross domestic product (GDP) per province in South Africa during 2007/2008.

**TABLE: Area, population and GDP per province during 2007/2008**

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>AREA (in km²)</th>
<th>POPULATION</th>
<th>GDP (in millions of rand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Cape</td>
<td>129 370</td>
<td>4 839 800</td>
<td>199 412</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>169 580</td>
<td>6 906 200</td>
<td>112 908</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>92 100</td>
<td>10 014 500</td>
<td>2312 616</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>361 830</td>
<td>1 102 200</td>
<td>30 087</td>
</tr>
<tr>
<td>Free State</td>
<td>129 480</td>
<td>2 965 600</td>
<td>75 827</td>
</tr>
<tr>
<td>North West</td>
<td>116 320</td>
<td>3 394 200</td>
<td>87 127</td>
</tr>
<tr>
<td>Gauteng</td>
<td>17 010</td>
<td>9 688 100</td>
<td>462 044</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>79 490</td>
<td>3 536 300</td>
<td>94 450</td>
</tr>
<tr>
<td>Limpopo</td>
<td>123 910</td>
<td>5 402 900</td>
<td>93 188</td>
</tr>
</tbody>
</table>

1.1 According to the Agricultural Research Council, 80% of South Africa’s land surface area is used for farming. However, only 11% of the farming land is suitable for the planting of crops (arable land). 3.2 million hectares of the farming land in the Free State is suitable for the planting of crops (arable land).

(a) Calculate the total area (in km²) of land that is used for farming in South Africa. (4)

(b) Calculate the percentage of land in South Africa suitable for planting crops (arable land) that is found in the Free State. (5)

1 hectare (1 ha) = 0.01 km²

Question 2

The following information about the Free State was given in the 2007/2008 South African Yearbook:

**Capital:** Bloemfontein

**Home languages:** Sesotho: 64,4%

Afrikaans: 11,9%

IsiXhosa: 9,1%

**Population:** 2 965 600 (mid-year population estimates in 2007)

**Area:** 129 480 km²

**Percentage of total area of South Africa:** 10,6%

**Gross domestic product (GDP) in 2004 (latest figure available):** R75 827 million

**Percentage of South Africa’s GDP in 2004:** 5,5%

2.1 Calculate the number of people in the Free State whose home languages were NOT Sesotho, Afrikaans or isiXhosa during the period 2007/2008. (4)

2.2 If a person is randomly selected from the Free State, determine the probability that the home language of the person is NOT Afrikaans or isiXhosa. (3)
2.3 Surveys have shown that 60% of the inhabitants of the Free State are employable. This means that the workforce is 60% of the total population of the Free State.

2.3(a) Identify any TWO possible reasons why 40% of the inhabitants are not employable. (2)

2.3(b) According to the Labour Force Survey of March 2007, the official unemployment rate in the Free State was 26,4% of the workforce. Calculate the number of unemployed people in the Free State at the time of this survey. (5)

Question 3

3.1 Ronwyn and Bronwyn are twins. They plan to celebrate their 21st birthday by having a big party. Ronwyn has decided that she wants a round cake, while Bronwyn has decided to have a ring cake, as shown in the pictures below.

The dimensions of each cylindrical cake is as follows:

![Cakes](image)

Diameter of 50 cm and a height of 15 cm

An outer diameter of 56 cm, an inner diameter of 18 cm and a height of 14 cm

The following formulae (using \(\pi = 3,14\)) may be used:

- **Volume of a cylinder** = \(\pi \times (radius)^2 \times height\)
- **Volume of a cylindrical ring** = \(\pi \times (R^2 - r^2) \times height\)
  where \(R\) = outer radius and \(r\) = inner radius

**Total outer surface area of an open cylinder**

\[ = \pi \times (radius)^2 + 2\pi \times radius \times height \]

3.1.1 Using the volume of each cake, determine which of the two cakes is better value for money if the costs of the two cakes are the same. Give a reason for your answer, showing ALL your calculations. (10)

3.1.2 Ronwyn decides that her round cake will be a fruit cake. The cake will be covered with marzipan icing on the top of the cake as well as around the sides. Determine the total outer surface area of the cake that the marzipan icing will cover. (6)
3.2 The twins can choose from the following two options for the catering for their party:

**OPTION 1**: R120 per head, which includes the payment for the venue, but excludes the 14% value-added tax (VAT).

**OPTION 2**: R3 200 for the hire of the venue and then R80 per head for catering, which includes the 14% VAT.

Analyse the two options and determine which ONE would be the cheaper option if 100 people in total will attend the party. Show ALL calculations.

(5)

**Question 4**

Thandi washes her dishes by hand three times daily in two identical cylindrical basins. She uses one basin for washing the dishes and the other for rinsing the dishes. Each basin has a radius of 30 cm and a depth of 40 cm, as shown in the diagram below.

Thandi is considering buying a dishwasher that she will use to wash the dishes daily.

4.1 Calculate the volume of one cylindrical basin in cm³.

\[
\text{Volume of a cylindrical basin} = \pi (\text{radius})^2 \times \text{height}, \text{ using } \pi = 3.14
\]

(2)

4.2 Thandi fills each basin to half its capacity whenever she washes or rinses the dishes. Calculate how much water (in litres) she will use daily to wash and rinse the dishes by hand. (1 000 cm³ = 1 liter)

(5)

4.3 A manufacturer of a dishwasher claims that their dishwasher uses nine times less water in comparison to washing the same number of dishes by hand.

4.3.1 How much water would this dishwasher use to wash Thandi’s dishes daily?

(2)

4.3.2 Is the claim of the manufacturer realistic? Justify your answer by giving a reason(s).

(3)
Interactive Q & A Test yourself

Question
Convert 1,25ℓ to mℓ if 1ℓ = 1 000 mℓ.  
Convert $1 215,00 to rand. Use the exchange rate $1 = R10,52.  
Write $379/250 as a decimal fraction.

(3) (2) (2)

Answer
1,25 × 1 000 m ℓ = 1 250 m ℓ
$1 = R10,52
$1 215,00 = R10,52 × 1 215,00 = R12 781,80
$379
250 = 1.516 ≤1.52

Question
315 guests and 1 050 learners attended a school function. The guests were served tea, while the learners received fruit juice.

Write down the ratio of the number of guests who attended the function to the number of learners. Give the ratio in the simplest form.

The school has found that for every 2 guests that drank rooibos tea, there were 5 guests that drank regular tea. Calculate the number of guests at the function who drank rooibos tea.

The concentrated fruit juice that was bought for the function comes in 5ℓ bottles and is diluted in the ratio of 1 part juice to 4 parts water. How many litres of diluted fruit juice can be made from one 5ℓ bottle of concentrated fruit juice?

(2) (2) (2)

Answer
315 : 1 050 = 3 : 10
2
7 × 315 guests = 90 guests
1 litre concentrate makes 5 litres of juice
5 litres concentrate makes 5 × 5 ℓ = 25 ℓ

Question
Naledi intends selling oranges at her school market day. She buys one dozen oranges for R9,00. She decides to sell the oranges in packets of six at R6,00 per packet. Calculate:

The cost price of ONE orange
The profit she will make per dozen oranges sold
How much it would cost Naledi to buy 108 oranges

(2) (2) (2)

Answer
Cost price of 1 orange = 9.00
12 = R 0.75 = 75 cents
1 dozen oranges sell for R12,00
Profit = R12,00 – R9,00
= R3,00
Cost = 108 × R0,75 = R81,00
Question
Mrs Maela Choeu is an old-age pensioner. She receives a social pension of R960,00 per month. The following are her monthly expenses:
- R15,45 for her pensioner bus ticket for 10 trips
- R24,50 for her hospital visit
- R60,00 for prepaid electricity
- R30,00 for her funeral policy
- R40,00 for her church contribution
- R86,40 for rental of her accommodation
- Balance for food and other living expenses

- What fraction (in the simplest form) of her pension amount does Mrs Choeu pay for her funeral policy? (3)
- Calculate the balance that Mrs Choeu has left monthly for food and other living expenses. (3)

Answer
- \[ \frac{30}{960} = \frac{1}{32} \text{ or 3.13\%} \]
- R960 – R15,45 – R24,50 – R60,00 – R30,00 – R40,00 – R86,40 = R703,65

Question
52 learners wrote the Grade 11 Geography examination. The ages (in years) of a sample of 15 of these learners are as follows:

- What age in the sample is the mode? (1)
- Determine the median age of the sample of learners. (1)
- Calculate the mean age of the sample of learners. (4)

Answer
- 17 years
- 17 years
- Mean

\[ \text{Mean} = \frac{16+16+16+17+17+17+17+17+18+18+19+19+19+20+20}{15} \]

= 15268 years
= 17,8666 ... years
= 17,87 years

Question
Calculate the volume of sand needed to fill the long jump pit to a depth of 0,07 m. Give the answer rounded off to THREE decimal places. Use the formula: \( \text{Volume} = \text{length} \times \text{breadth} \times \text{height} \) (3)

Answer

\[
V = 9 \text{ m} \times 2,75 \text{ m} \times 0,07 \text{ m} \\
= 1,7325 \text{ m}^3 \\
\approx 1,733 \text{ m}^3
\]

Question

One of the key functions of the Department of Social Development is to provide social assistance to people in need. The following table shows both the number and the percentage of beneficiaries allocated to each type of grant during 2005 and 2007:

<table>
<thead>
<tr>
<th>TYPE OF GRANT</th>
<th>2005</th>
<th></th>
<th>2007</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of</td>
<td>%</td>
<td>Number of</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>beneficiaries</td>
<td></td>
<td>beneficiaries</td>
<td></td>
</tr>
<tr>
<td>Old-age pensioners</td>
<td>2 097 723</td>
<td>22,3</td>
<td>2 190 686</td>
<td>18,2</td>
</tr>
<tr>
<td>Child support</td>
<td>5 662 911</td>
<td>60,2</td>
<td>7 908 138</td>
<td>65,7</td>
</tr>
<tr>
<td>Disability</td>
<td>1 507 549</td>
<td>A</td>
<td>1 420 535</td>
<td>11,8</td>
</tr>
<tr>
<td>Other</td>
<td>338 646</td>
<td>3,6</td>
<td>517 580</td>
<td>4,3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9 406 829</td>
<td>100</td>
<td>B</td>
<td>100</td>
</tr>
</tbody>
</table>

- What percentage of the grants allocated during 2007 were for old-age pensioners? (2)
- Calculate the difference between the number of beneficiaries receiving child support grants during 2005 and 2007. (2)
- Calculate the following missing values from the table:
  (a) A (2) (b) B (2)

Answer

- 18,2%
- Difference = 7 908 138 − 5 662 911
- = 2 245 227
- A = 13,9 \quad B = 12 036 739
Topic 1 Solutions

Question 1

1.1 Option A: Amount = $P(1+i)^n$
   = $15000(1+1/2 \times 12/100)^2$
   = R16854

1.2 Option B: Interest = 12% of R15000 \times 1
   = R1800,00
   Amount = R15000,00 + R1800,00
   = R16800,00

Or
   \( A = P \left(1 + \frac{in}{100}\right) \)
   = 15000 \left(1 + 0.12 \times 1\right)
   = R16800

1.3 Guylain will choose option B. (Amount = R16800,00) because he wishes to pay less money.

1.4 Molefe will choose option A. (Amount = R16854,00), because he wishes to get more money.

Question 2

2.1 20 days

2.2 Approximately \( \frac{31}{3} \) days, or \( \frac{20}{6} \) days

2.3(a) 4 workers

2.3(b) 3 workers OR about 3 workers

   OR 2 \( \frac{1}{2} \) workers

   OR 2 workers on a full time basis and third worker to work half of each day

Question 3

3.2(a) Win both matches: number of events = 1
So, \( P(\text{win both matches}) = \frac{1}{9} \) or 0.11 or 11.11%

3.2(b) Win only one of the matches:
Number of events = 4
\( P(\text{win only one of the matches}) = \frac{4}{9} \)
   or 0.44 or 44.44%

3.2(c) Draw at least one of the matches:
Number of events = 5
\( P(\text{draw at least one of the matches}) = \frac{5}{9} \)
   or 0.56 or 55.56%
Question 4

4.1 Number of houses surveyed
\[= 723 + 219 + 534 + 427 + 298 + 291 = 2492\]

4.2(a) \[P(2 \text{ or fewer people}) = \frac{\text{number of houses occupied by 2 or fewer people}}{\text{number of houses surveyed}}\]
\[= \frac{723 + 219 + 534}{2492} = \frac{1476}{2492} = \frac{369}{623}\]

4.2(b) \[P(\text{more than 2 people}) = 1 - \frac{1476}{2492} = \frac{1016}{2492} = \frac{254}{623}\]

\[P(2 \text{ or fewer people}) > P(\text{more than 2 people})\]
So, a greater probability is of choosing a house with 2 or fewer staying in it

Question 5

5.1 Possible arrangement of passengers in the minibuses: 3 minibuses with 15 passengers each and 2 with 10 passengers and 1 with 12 passengers
OR 5 minibuses with 13 passengers in each and 1 minibus with 12 passengers

5.2 Possible arrangement of passengers in the minibuses:
3 minibuses with 15 passengers each and 2 with 10 passengers and 1 with 12 passengers
OR 5 minibuses with 13 passengers in each and 1 minibus with 12 passengers

Question 6

6.1 \[P(\text{boy in Grade 12}) = \frac{60}{302} = \frac{30}{151} \approx 0.20 \text{ or } 19.87\%\]

6.2 Number of learners NOT in Grade 10 = 77 + 60 = 137
\[P(\text{not in Grade 10}) = \frac{137}{302} \approx 0.45 \text{ or } 45.36\%\]
Topic 2: Solutions

Question 1

Radius of bus tyre = 60 cm
Radius of minibus tyre = \(\frac{7}{12} \times 60\text{ cm} = 35\text{ cm}\)
Circumference of minibus tyre = \(2 \times 3.14 \times 35\text{ cm} = 219.8\text{ cm} = 0.002198\text{ km}\)

\[\therefore 1862 = \frac{\text{distance travelled}}{0.002198\text{ km}}\]
Distance travelled = 1 862 0.002198 km = 4.092676 = 4 km

Question 2

5mm = 0.5cm
Allowance = 0.5 x 2 = 1 cm (both sides)
Length of box = 60 cm + 1 cm = 61 cm
Height of box = 2 cm + 5 cm + 45 cm + 1 cm = 53 cm
Width of box = 20 cm + 1 cm = 21 cm

Volume of box = 61 cm \times 53 cm \times 21 cm = 67,893 cm^3

Question 3

3.1 \[V = l \times b \times h\]
= 2.5 m \times 2 m \times 1.5 m
= 7.5 m^3
= 7,5 k\ell

3.2 \[S.A. = (l \times b) + 2 \times (l \times h) + 2 \times (b \times h)\]
= \[[(2.5 \times 2) + 2 \times (2.5 \times 1.5) + 2 \times (2 \times 1.5)]\ m^2\]
= \[5 + 2(3.75 + 3)\ m^2\]
= \[5 + 2 \times 6.75\] m^2 = 18.5 m^2

3.3 Glass = 20 m^2 \times R 480.00 per m^2 = R 9 600.00

3.4 A discount of 15% gives a balance of 85%.
Amount paid for the pump
= 85% of R 3 999,00 OR \[\frac{85}{100} \times R 3 999,00 = 3 399,15\]

3.5 Time taken to fill the tank = \[\frac{6.900}{2.300}\ hours\]
= 3 hours

4.1 C3
4.2 South East
4.3 Turn left into 4th Street A Turn left into Buiten Street
After passing Gerrie Visser Street turn right into the next street. You will see the petrol station ahead of you.

Or Turn left into 4th Street, Turn left into Wishart Street, Turn right into Gerrie Visser Street, Turn left into Buiten Street. You will see the petrol station ahead of you

4.4 1 cm represents 11 000 cm
So, 11 cm = 11 000 \times 11 cm = 121 000 cm = 1 210 m
Topic 3 Solutions

Question 1

1.1(a) Total area of South Africa
\[= (129370+169580+361830+129480+116320+17010+79490+724100+129480) \text{ km}^2 \]
\[= 1 \text{ 219 090 km}^2 \]

Land for farming = 80% of 1 219 090 km$^2 = 975 272$ km$^2$

1.1(b) Continuing from 2nd solution in (a):

Arable land = 11% of 977 208 km$^2 = 10 749 288$ km$^2$

\[= \frac{3 \times 10^7 492.88}{0.01} \text{ ha} \]

% arable land in the Free State = \[\frac{3 \times 10^7 000}{10 749 288} \times \frac{100}{1} \approx 29.77\% \]

Question 2

2.1 Percentage using other languages
\[= 100\% - (64.4\% + 11.9\% + 9.1\%) = 100\% - 85.4\% = 14.6\% \]

Number speaking other languages
\[= 14.6\% \text{ of } 2 965 600 = 432 977.6 \approx 432 978 \]

2.2 P(Afrikaans and isiXhosa) = 21%
P(not Afrikaans and isiXhosa) = 100% – 21%
\[= 79\% \text{ (or } 0.79 \text{ or } \frac{79}{100} \text{ or } \frac{234324}{2969600}) \]

2.3(a) They are children / the elderly / people who are sick/ill / don’t have an identity document / may not speak the correct language for the area/lack of skills/ lack of qualifications

2.3(b) Workforce = 60% of 2 965 600 = 1 779 360

Unemployed = 26.4% of 1 779 360 = 469 751.04 \approx 469 751

Question 3

3.1.1 Volume of a round cake (Ronwyn)
\[= \pi \times (\text{radius})^2 \times \text{height} \]
\[= 3.14 \times (250 \text{ cm})^2 \times 15 \text{ cm} \]
\[= 29 437.5 \text{ cm}^3 \]

Volume of a ring cake (Bronwyn)
\[= \pi \times (R^2 - r^2) \times \text{height} \]
\[= 3.14 \times [(28 \text{ cm})^2 - (9 \text{ cm})^2] \times 14 \text{ cm} \]
\[= 30 903.88 \text{ cm}^3 \]

The ring cake as it is the cake with the largest volume
3.1.2
Total outer surface area
\[= \pi \times (\text{radius})^2 + 2 \pi \times \text{radius} \times \text{height}\]
\[= 3.14 \times (25\,\text{cm})^2 + 2 \times 3.14 \times 25\,\text{cm} \times 15\,\text{cm}\]
\[= 1962.5\,\text{cm}^2 + 2355\,\text{cm}^2\]
\[= 4317.5\,\text{cm}^2\]

3.2 Cost for Option 1:
Cost for 100 people
\[= 100 \times R120 + R12\,000 \times \frac{14}{100}\]
\[= R12\,000 + R1\,680\]
\[= R13\,680\]

Cost for Option 2:
Cost for 100 people
\[= R3\,200 + 100 \times R80\]
\[= R11\,200\]
Option 2 is the cheaper option

Question 4
4.1 Volume of the basin = \( \pi \, r^2 \, h \)
\[= 3.14 \times (30\,\text{cm})^2 \times 40\,\text{cm}\]
\[= 113\,040\,\text{cm}^3\]

4.2 Half of the volume of the basin = \( \frac{113\,040}{2} \)
\[= 56\,520\,\text{cm}^3\]
\[= 56.52\,\text{litres}\]
Each time she washes and rinses the dishes she uses:
56.52 litre \times 2 \text{ half-filled basins} = 113.04 litres
Thus water used to wash three times a day:
113.04 litres \times 3 \text{ washings per day} = 339.12 litres

4.3.1 According to the advertisement, the dishwasher would use \( \frac{339.12}{9} \) litre
\[= 37.68\,\text{litre}\]

4.3.2 Thandi would save 301.44 litre per day, which seems to be an exaggeration and thus is not realistic. Thandi would be saving water.