



NATIONAL SENIOR CERTIFICATE EXAMINATION  
SUPPLEMENTARY EXAMINATION – MARCH 2019

**MATHEMATICAL LITERACY: PAPER I**

**EXAMINATION NUMBER**

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Time: 3 hours

150 marks

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**PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY**

1. This question paper consists of:
    - 24 pages
    - 5 questions
  2. Ensure that your question paper is complete.
  3. Answer ALL the questions.
  4. Answer questions in the space provided on this paper and hand it in at the end of the examination session. Remember to write your examination number in the spaces provided.
  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 unless stated otherwise.
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Question	1	2	3	4	5	Total
Mark						
Total	34	35	21	31	29	150

**QUESTION 1**

The currency of South Africa is the rand. The following banknotes and coins are available in the rand currency:

Banknotes: R10, R20, R50, R100 and R200

Coins: 10c, 20c, 50c, R1, R2, R5, Krugerrand



- 1.1 If you had one of each coin (excluding a Krugerrand), you would have a total of R8,80. Calculate how much money you would have if you had this total of R8,80 and one of each bank note.

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(2)

- 1.2 Below is a description found on [www.wikipedia.com](http://www.wikipedia.com) about the Krugerrand.

<b>Krugerrand</b>	
<b>Value:</b>	1 troy oz. fine gold
<b>Mass:</b>	33,93 g
<b>Diameter:</b>	32,77 mm (1,28 in)
<b>Thickness:</b>	2,84 mm (0,11 in)
<b>Years of Minting:</b>	1967 – present

<b>Obverse</b>	<b>Reverse</b>

Glossary: A **troy ounce** is a unit of measure used for weighing precious metals that dates back to the Middle Ages. It is used in the pricing of metals such as gold, platinum and silver.

1.2.1 On 16-02-2018 the gold price was \$1 364,20 per troy ounce. 24 hours earlier, it was \$8,80 less.

(a) What was the gold price on 15-02-2018?

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(2)

(b) R1 = \$0,086. How much was a Krugerrand worth in rand on 16-02-2018?

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(3)

(c) On 16-02-2018 the price per troy ounce of gold, in rand, included 14% VAT. Calculate what the cost per troy ounce of gold excluding VAT was.

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(3)

1.2.2 91,67% of a Krugerrand is made up of gold, the rest is copper. What percentage of a Krugerrand is made of copper?

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(2)

1.2.3 What is the probability that a Krugerrand, when tossed in the air, will land on the obverse side?

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(2)

1.2.4 For how many years has the Krugerrand been in production?

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(2)

1.3 The statistics given below shows the inflation rate in South Africa from 2012 to 2018.

*South Africa: Inflation rate from 2012 to 2018 (compared to the previous year)*

2012	2013	2014	2015	2016	2017	2018
5,62%	5,76%	6,09%	4,58%	6,34%	5,43%	5,33%

1.3.1 How many months passed from 1 January 2012 to 31 January 2018?

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(2)

1.3.2 Calculate the average rate of inflation from 2012 to 2018.

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(3)

1.3.3 Calculate 5,33% of R15 800.

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(2)

1.3.4 Increase R15 800 by 5,33%.

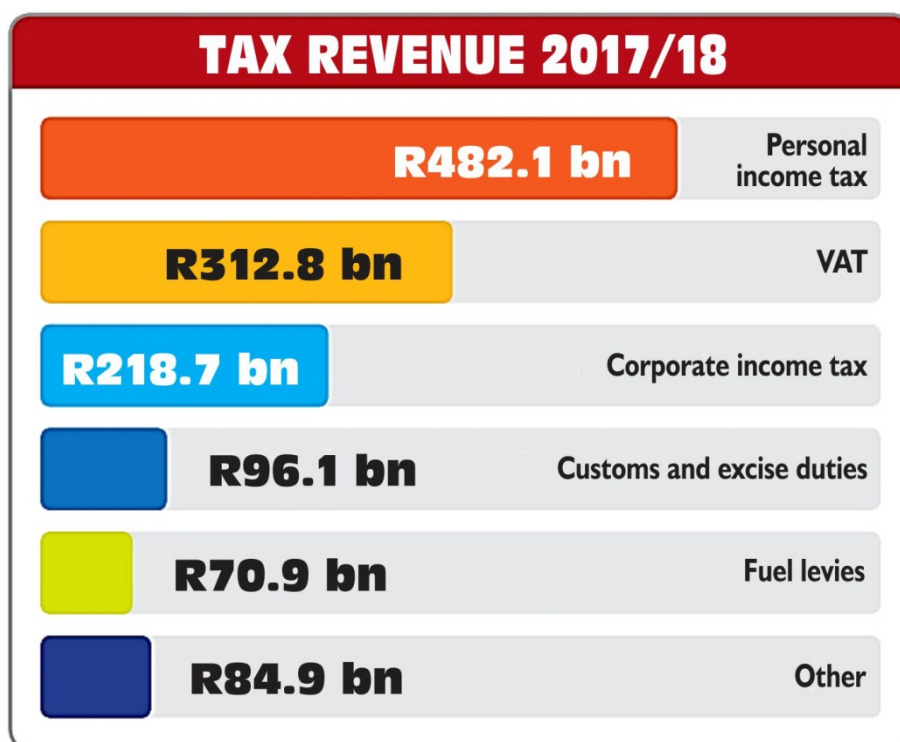
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(2)

1.4 The South African government collects money (rand) through tax. Study the bar graph below and answer the questions that follow:



[Source: <www.sapeople.com>]

1.4.1 What does *bn* stand for?

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(1)

- 1.4.2 Calculate the total amount the government received in revenue, according to the graph on the previous page.

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(2)

- 1.4.3 How much more money is collected from Personal Income Tax than Corporate Income Tax?

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(3)

- 1.4.4 The VAT charged on goods and services amounted to R312,8 bn. If VAT was charged at 14%, calculate the total amount spent by South African citizens on these goods and services in the 2017/2018 tax year.

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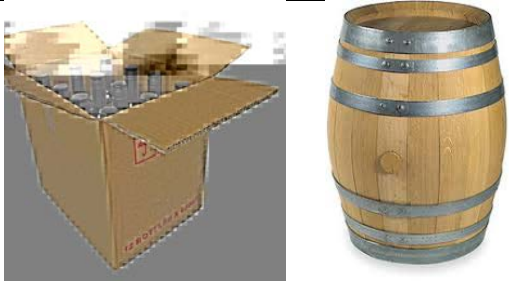


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(3)  
**[34]**

**QUESTION 2**

South Africa is the world's 7th largest wine producer. Its vineyards account for 4% of the global wine output. The volume of wine produced have increased by 20% over four years to approximately 420 million litres annually.

2.1 Study the infographic below and answer the questions that follow:

 <p>1 bunch = 1 glass</p>	 <p>5 glasses = 1 bottle</p>
 <p>25 cases = 1 barrel</p>	 <p>1 barrel = 30 vines</p>
 <p>400 vines = 1 acre</p>	

Glossary: A **vine** is a climbing or trailing woody-stemmed plant.

2.1.1 How many bunches of grapes are needed to produce one bottle of wine?

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(2)

- 2.1.2 One bottle of wine has a capacity of 750 ml. Determine the capacity of one glass of wine.

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(2)

- 2.1.3 Determine the volume of one barrel in litres, if a case contains 12 bottles.

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(4)

- 2.1.4 How many full barrels of wine can be produced from one acre of land?

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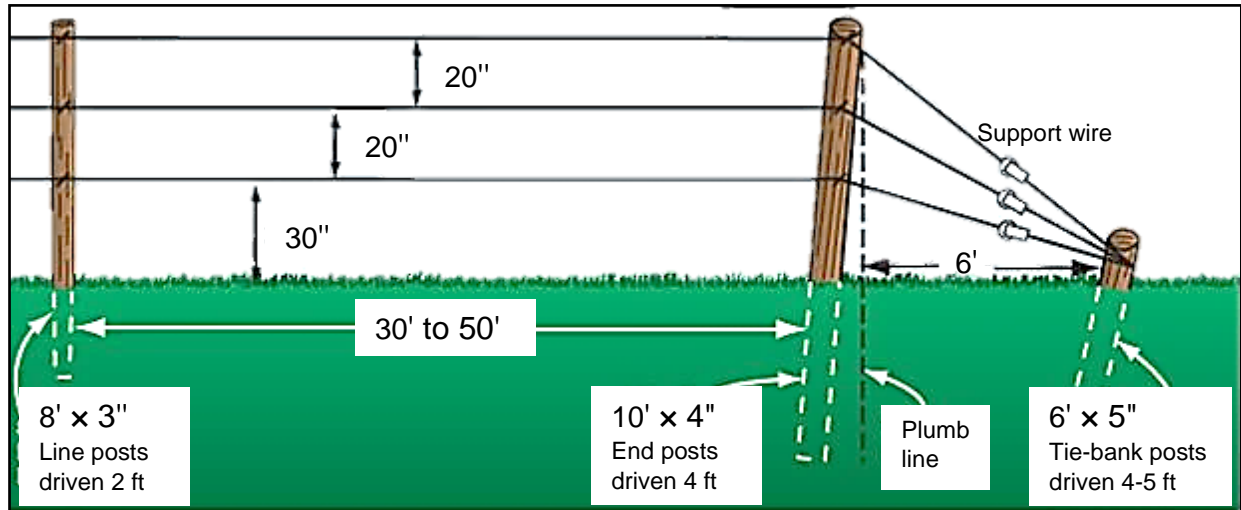
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(3)



- 2.2 The diagram below illustrates the spacing required between vines. This is to allow for adequate growth to properly ripen the crop, but avoid excessive vegetative growth.

All measurements given in feet (') and inches (").



1 m = 3,28 feet

- 2.2.1 What is the maximum distance possible, in metres, between the line post and the end post?

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(3)

- 2.2.2 If the vines must be planted 1,2 m apart to achieve optimum growth, how many vines can be planted between two posts?

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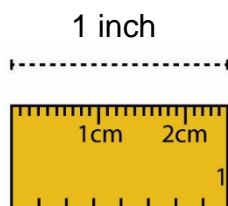
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(2)

- 2.2.3 How many cm in an inch?




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(2)

- 2.2.4 Calculate the total height that the vine would grow up to in cm if the vine grows to the top support wire.

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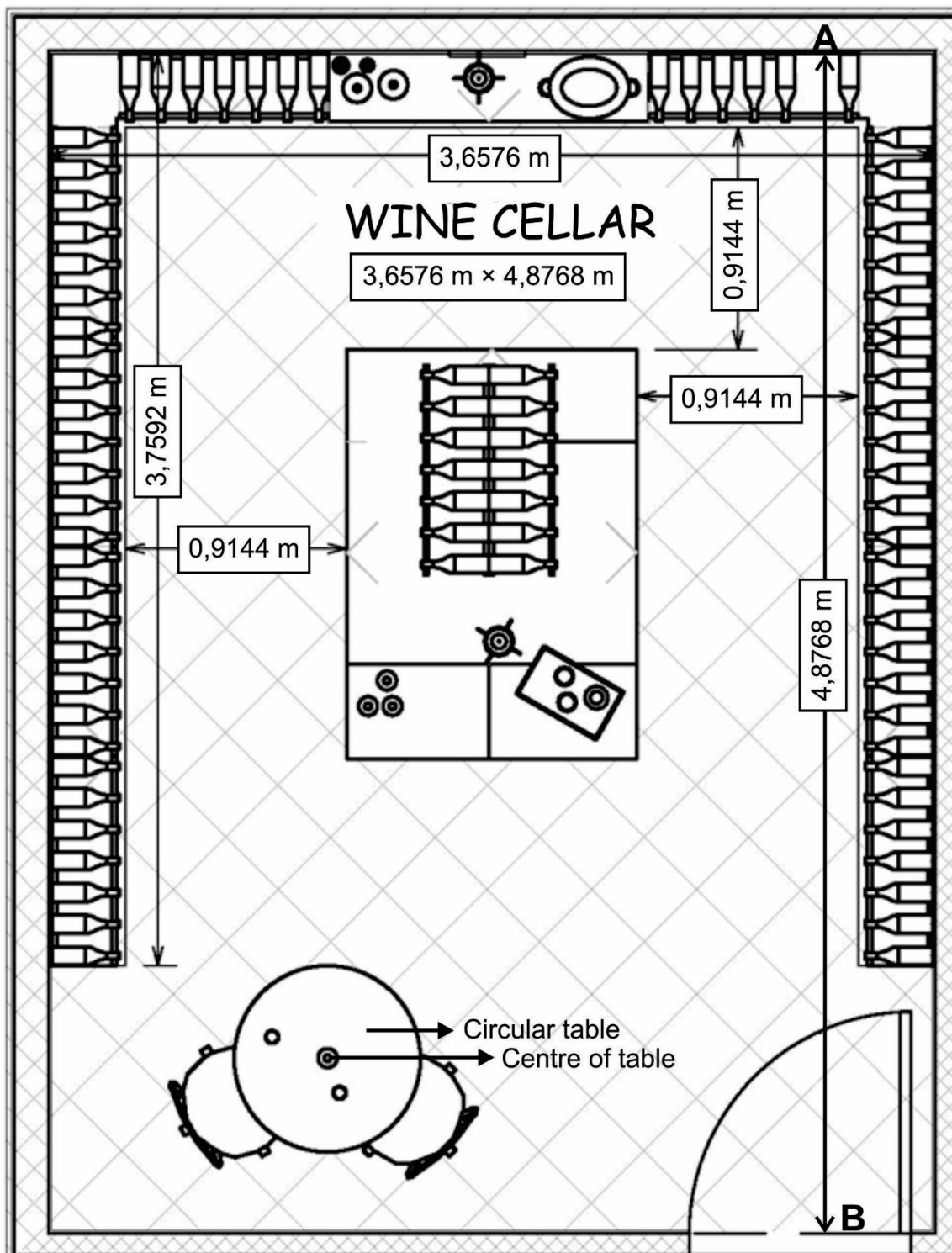
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(3)

- 2.3 Wine connoisseurs (experts) would keep their wines in a wine cellar as illustrated in the diagram below. Study the floorplan and answer the questions that follow.



- 2.3.1 Calculate the total floor area of the wine cellar to the nearest square metre.

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(3)

- 2.3.2 Determine the scale of the floorplan to the nearest whole number by measuring the line from point A to B.

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(4)

- 2.3.3 Using the scale determined above, calculate the actual circumference of the circular table in metres.

Circumference =  $2 \times \pi \times r$     OR    Circumference =  $\pi \times \text{diameter}$   
 $\pi = 3,142$

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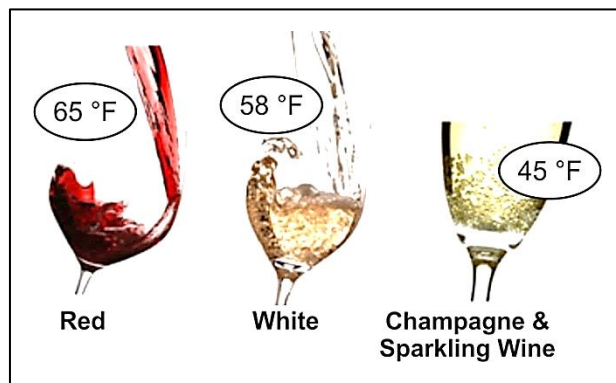
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(3)

2.3.4 It is recommended that wine be served at the following temperatures.



[Adapted: <thewineshoplifestyle.com>]

- (a) How much colder must champagne be served than red wine?

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(2)

- (b) Determine at what temperature in °C the image above recommends red wine be served.

Formula:  $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$

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(2)  
[35]

**QUESTION 3**

Peru is a country that lies along the west coast of South America. It has 3 253 679 citizens living on 1 285 216 km<sup>2</sup>.

3.1 Calculate how many people live per km<sup>2</sup> in Peru.

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(2)

3.2 Study the map below and answer the questions that follow:



3.2.1 Which country lies directly north of Peru?

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(2)

3.2.2 Using the bar scale on the map, determine the distance, in km, from point A to B.

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(4)

3.2.3 1 000 km is approximately equivalent to 625 miles. Determine how many miles are in one kilometre.

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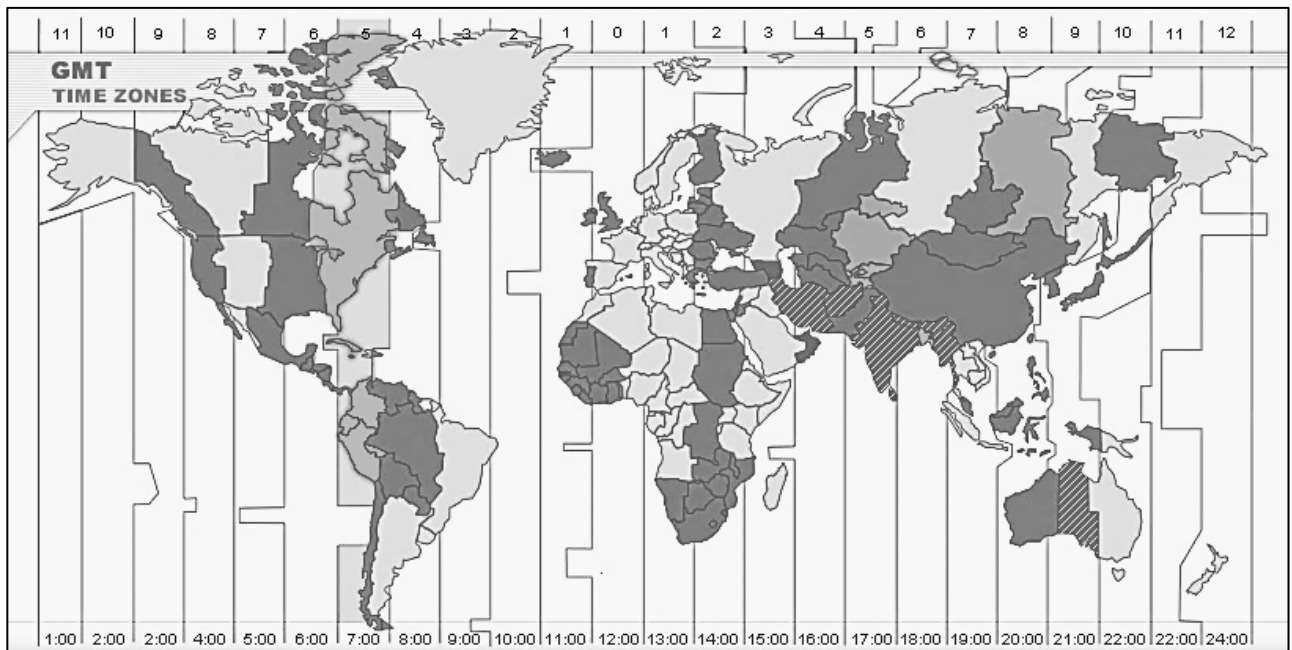
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(2)

3.3 A time zone is an area on Earth that has a specific time that all citizens can set their clocks to. Different time zones exist as you move from east to west (or west to east) on the surface of the earth. The further you travel, the more time zones you'll pass through.

For example, when it is 14:00 in Johannesburg (Time Zone 2 East) then it will be 17:00 in India (Time Zone 5 East) and when it is 12:00 in England (Time Zone 0) then it is 06:00 in Mexico (Time Zone 6 West).

Study the world map given on the next page and answer the questions that follow:



[Source: Google images]

3.3.1 If it was 12:00 in Time Zone 0, what time would it be in Time Zone 3 East (Madagascar)?

\_\_\_\_\_ (2)

3.3.2 How many hours are Peru (Time Zone 5 West) and South Africa (Time Zone 2 East) apart?

\_\_\_\_\_  
 \_\_\_\_\_ (2)

3.3.3 If the sun rises in Peru at 06:30 what time will it be in South Africa?

\_\_\_\_\_  
 \_\_\_\_\_ (2)



- 3.4 Machu Picchu (ancient Inca ruins) is the most famous tourist attraction in Peru. To get there from Cusco requires a bus trip to Ollantaytambo, a train trip to Aguas Calientes and another short drive to Machu Picchu.



[Adapted: <www.misstourist.com>]

- 3.4.1 What is the total length of time the journey from Cusco to Machu Picchu takes?

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(2)

- 3.4.2 The distance from Cusco to Machu Picchu is 74,7 km. The distance from Ollantaytambo to Machu Picchu is only 32,2 km but because of the rough terrain (landscape) it is very difficult to get to. Calculate the average speed of the entire journey.

*Distance = Speed  $\times$  Time*

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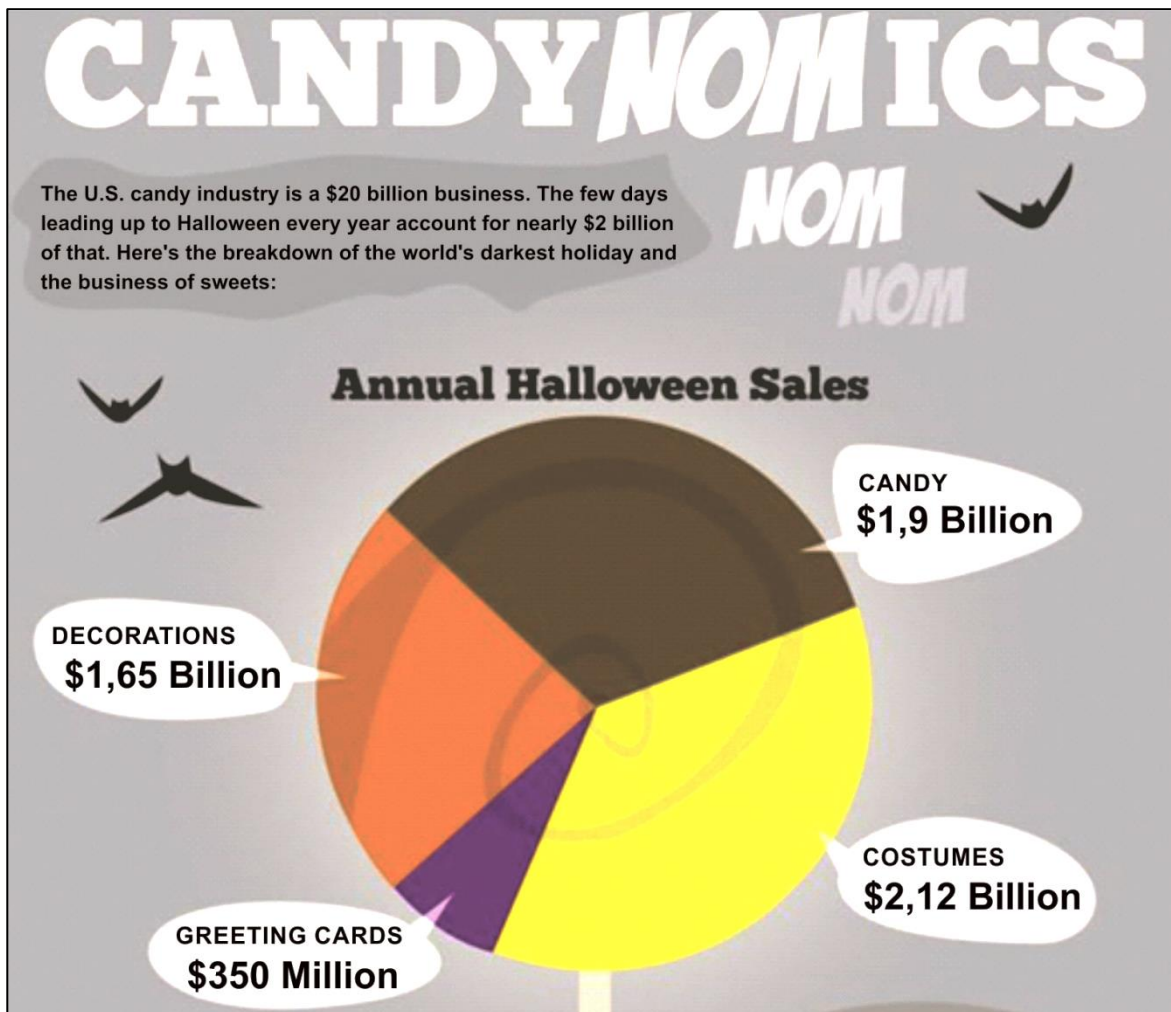
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(3)  
[21]

**QUESTION 4**

Halloween is a much-celebrated holiday in the United States of America. Read the fun facts below and study the Candynomics pie chart to answer the questions that follow:

- Nearly 120 million Americans dress up for Halloween.
- There are 36 000 000 children between the ages of 5 and 13 who go trick-or-treating in America.
- There are 111 000 000 occupied houses in America.



[Source: <www.trendhunter.com>]

**NOTE: One billion = 1 000 million**

- 4.1    4.1.1 How many children between the ages of 5 and 13 go trick-or-treating on Halloween in America? Write your answer in words.

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(2)

4.1.2 How much money in total is spent on Halloween by Americans?

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(2)

4.1.3 What percentage of the total spending is spent on costumes?

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(3)

4.1.4 (a) If 50% of American homes are decorated, how many houses are decorated?

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(2)

(b) How much is spent on average per house for decorations?

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(2)

4.1.5 Some adults also love to dress up for Halloween. The top five adult costumes are:

Witch	13,4%
Pirate	3,9%
Vampire	3,7%
Batman	2,2%
Cat	2,2%

(a) An adult walks into a costume store and chooses a costume at random. What is the percentage probability that it will be a witch costume?

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(2)

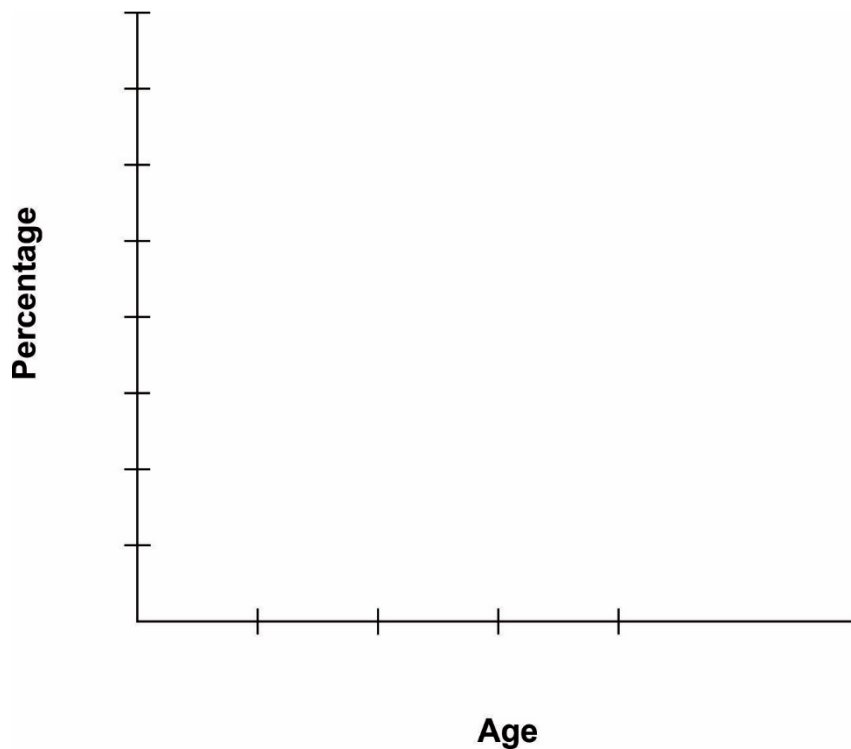
- (b) Which costume stands a  $\frac{11}{500}$  chance of being picked by an adult?

\_\_\_\_\_ (2)

4.1.6 Below is a table that illustrates the percentage, by age, of adults who plan to dress up for Halloween:

16–24	85,3%
25–33	76,5%
34–42	71,3%

Construct a histogram to illustrate this data.



(6)

- 4.2 Below is a table depicting the annual spending on Halloween in America from 2010 to 2015.

Year	Amount Spending
2015	\$7,95 billion
2014	\$7,1 billion
2013	\$6,9 billion
2012	\$6,35 billion
2011	\$7 billion
2010	\$5,6 billion

- 4.2.1 Determine the mean spending (in billions) on Halloween from 2010 to 2015.

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(3)

- 4.2.2 Determine the median spending (in billions) on Halloween from 2010 to 2015.

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(3)

- 4.2.3 Write your answer to Question 4.2.2 as a number without using the word million or billion.

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(2)

- 4.2.4 Determine the range (in billions) in spending from 2010 to 2015.

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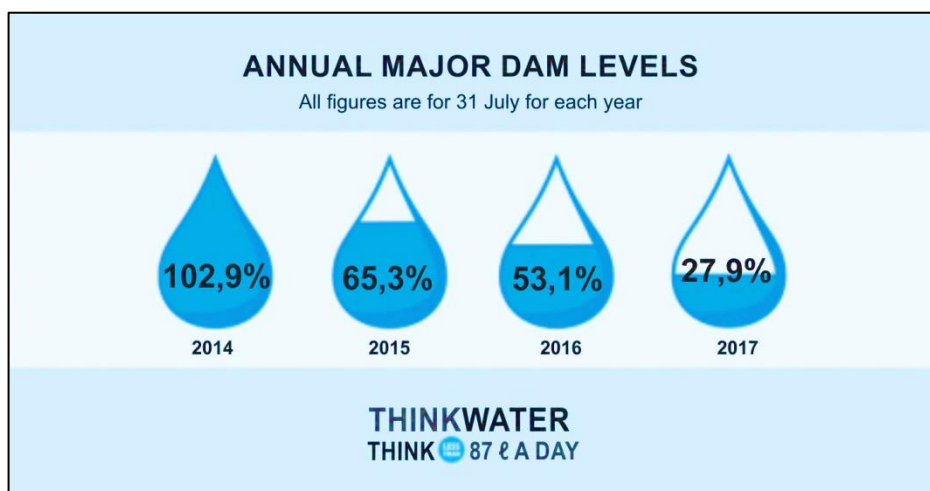
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(2)

[31]

**QUESTION 5**

- 5.1 Dam levels in the Cape have dropped dramatically in the last few years. Study the infographic below to answer the questions that follow:



[Source: <www.capetownetc.com>]

- 5.1.1 How many days passed in which the dam levels decreased by 37,4%?

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(3)

- 5.1.2 Six dams feed the city of Cape Town. Collectively these dams can hold 898 221 million litres of water. How much water did the dams hold in 2014?

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(3)

- 5.1.3 What is the percentage decrease in water levels between 2014 and 2017?

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(3)

- 5.1.4 The municipality introduced water restrictions on 1 July 2017. This allowed Capetonians to use 87 litres of water per person, per day. Exactly 2 months later, it was announced that stricter restrictions would have to be adhered to. On what date were these new restrictions introduced?

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(2)

- 5.2 [www.capetownetc.com](http://www.capetownetc.com) provides a guide as to how to use only 50 litres of water in a day. Study the guide given below and answer the questions that follow:



[Source: <[www.capetownetc.com](http://www.capetownetc.com)>]

- 5.2.1 How many litres should be used for personal hygiene, i.e. shower, teeth and hands?

(2)

- 5.2.2 What percentage of the water should be used for drinking?

(2)

- 5.2.3 Calculate the size (degrees) of the sector that represents *house cleaning* water (5 litres).

(2)

- 5.3 Below are the new water tariffs introduced in Cape Town. Study them carefully and answer the questions that follow:

Residential Water Tariffs (Domestic Full and Domestic Cluster)		
Water Steps (1 kℓ = 1 000 litres)	Level 4 (2017/18) Until 31/1/2018 Rand/kℓ (incl VAT)	Level 6 (2017/18) From 1/2/2018 Rand/kℓ (incl VAT)
Step 1 ( $>0 \leq 6$ kℓ)	R4,56	R29,93
Step 2 ( $>6 \leq 10,5$ kℓ)	R17,75	R52,44
Step 3 ( $>10,5 \leq 20$ kℓ)	R25,97	R114
Step 4 ( $>20 \leq 35$ kℓ)	R43,69	R342
Step 5 ( $>35 \leq 50$ kℓ)	R113,99	R912
Step 6 ( $>50$ kℓ)	R302,24	R912

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

- 5.3.1 What is the charge per kilolitre of water for 6 kilolitres under the Level 6 restrictions?

\_\_\_\_\_ (2)

- 5.3.2 What will the total cost be for 6 kilolitres of water under the Level 6 restrictions?

\_\_\_\_\_  
\_\_\_\_\_ (2)

- 5.3.3 For how many days will a family of 3, using a total of 150 ℓ of water a day, have water if they only use 6 kℓ of water.

\_\_\_\_\_  
\_\_\_\_\_ (3)

- 5.3.4 Determine the cost of 23 kℓ of water under the Level 6 restrictions.

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\_\_\_\_\_ (5)

[29]

**Total: 150 marks**