



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2010

MARKS: 150

TIME: 3 hours

This question paper consists of 15 pages and 2 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions. Answer ALL the questions.
2. QUESTION 3.1.3 and QUESTION 6.2.2(a) must be answered on the attached ANNEXURES. Write your centre number and examination number in the spaces on the annexures and hand in the annexures with the ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. ALL the calculations must be clearly shown.
7. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
8. Units of measurement must be indicated where applicable.
9. Write neatly and legibly.

QUESTION 1

- 1.1 1.1.1 Simplify:
- (a) $15,43 + 46,08 \times 15,6875$ (2)
- (b) $\frac{17 - 5}{3} \times (29,35 - 10,63)$ (2)
- 1.1.2 Write 2,875 as a common fraction in its simplest form. (2)
- 1.1.3 Convert R110,35 (South African rand/ZAR) to Algerian dinar (DZD) if 1 ZAR = 9,48 DZD. (2)
- 1.1.4 Convert 3 024 cm to metres. (2)
- 1.1.5 Calculate $6\frac{1}{4}\%$ of 420 000. (2)
- 1.1.6 It cost Ridge R1 150,00 to make a matric dance dress. He sold it for R1 840,00.

Use the following formula to calculate the percentage profit made on the dress:

$$\text{Percentage profit} = \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\% \quad (2)$$

- 1.2 The principal of Hills Primary School compiled data of the number of learners who receive social grants in each class.

He arranged these numbers in ascending order, as follows:

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 1 | 1 | 2 | 2 |
| 2 | 3 | 3 | 3 | 3 | 4 | 4 |
| 5 | 5 | 6 | 6 | 6 | 7 | 7 |

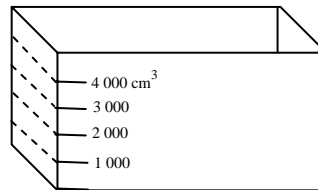
- 1.2.1 How many different classes are there at Hills Primary School? (1)
- 1.2.2 Determine:
- (a) The mode (2)
- (b) The median (2)

1.3 During an experiment, an amount of liquid was poured into a calibrated rectangular container, as shown in the diagram below.

A **calibrated container** has accurate measurements marked on it. It is used to measure volume.

The dimensions of the container are:

length = 50 cm, breadth = 40 cm and height = 45 cm



A calibrated rectangular container

1.3.1 Calculate the volume, in cm^3 , of the container.

Use the following formula: **Volume = length \times breadth \times height** (2)

1.3.2 $3\,000\text{ cm}^3$ of the liquid was poured into the calibrated container.

Calculate the height of the liquid in the container by using the following formula:

$$\text{Height of liquid} = \frac{\text{volume of liquid}}{\text{length} \times \text{breadth}} \quad (2)$$

1.4 Casual workers employed during the Soccer World Cup were paid an hourly rate of R12,50.

The following formula may be used:

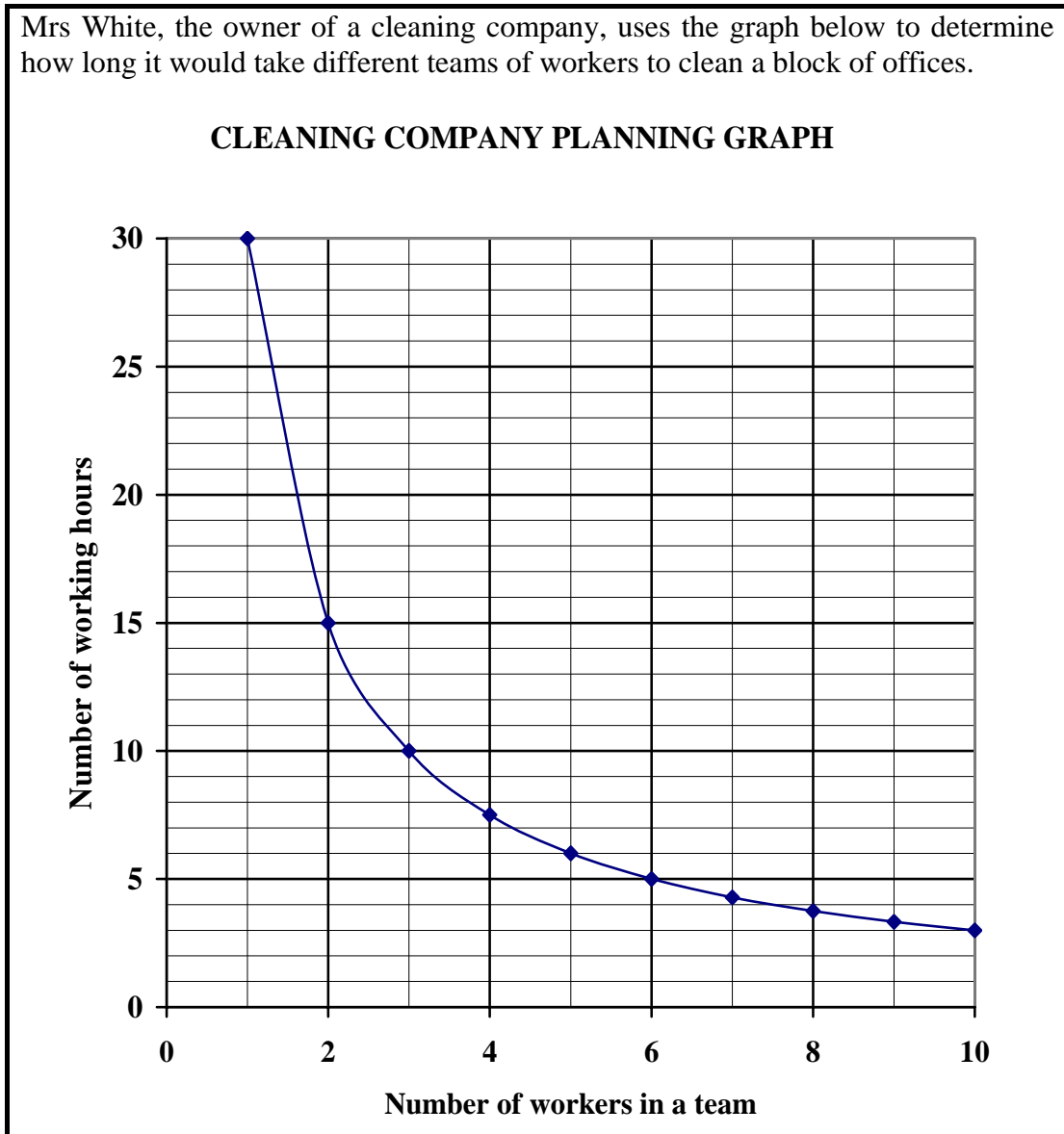
Daily payment = hourly rate \times number of hours worked

1.4.1 One casual worker worked $8\frac{1}{2}$ hours daily. How much did he/she earn daily? (2)

1.4.2 A casual worker was paid a total of R218,75. For how many hours did he/she work? (2)

1.5

Mrs White, the owner of a cleaning company, uses the graph below to determine how long it would take different teams of workers to clean a block of offices.

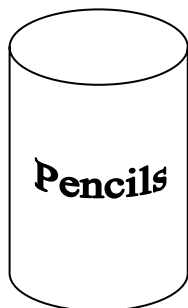


- 1.5.1 How long will it take THREE workers to clean the same block of offices? (2)
 - 1.5.2 How many workers will she need to employ to complete cleaning the same block of offices in exactly SIX hours? (2)
 - 1.5.3 Estimate the number of hours it will take FOUR workers to clean the same block of offices. (2)
- [33]**

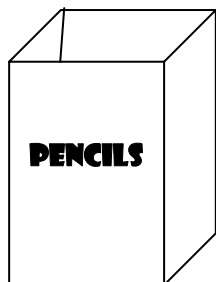
QUESTION 2

2.1

Thandiwe wants to make a new pencil holder. She has a choice of an open cylindrical holder or an open rectangular holder. She wants to cover the outside of the holder to match the table cloth on her desk.



A cylindrical holder with: radius = 5 cm and height = 15 cm



A rectangular holder with: length = 10 cm, breadth = 8 cm and height = 15 cm

The following formulae may be used:

Lateral surface area of a cylinder = $2\pi \times \text{radius} \times \text{height}$, and using $\pi = 3,14$

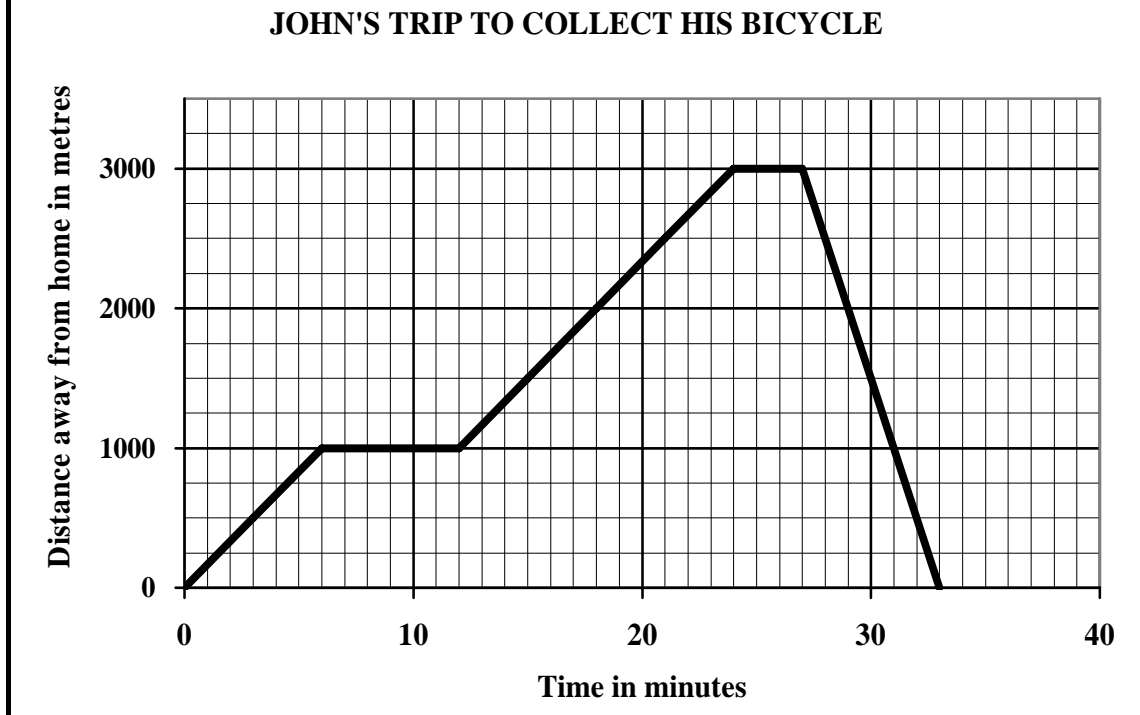
Lateral surface area of a rectangular prism = $2 \times (\text{length} + \text{breadth}) \times \text{height}$

2.1.1 Determine the lateral surface area of:

- (a) The cylindrical holder (2)
- (b) The rectangular holder. (3)

2.2

The graph below illustrates John's trip to the bicycle shop, 3 000 m away from his home, to collect his bicycle that was sent for repairs. He first walked to the post office to buy stamps and then went to collect his bicycle. He rode the bicycle back home.



- 2.2.1 How many minutes was John away from home? (1)
- 2.2.2 How long did John take to reach the post office, 1 000 m away from his home? (2)
- 2.2.3 How many minutes did John spend at the post office? (2)
- 2.2.4 How far was John away from home after 21 minutes? (2)
- 2.2.5 After how many minutes did John begin his journey back home? (2)
- 2.2.6 John took 12 minutes to walk from the post office to the bicycle shop. If he left the post office at 10:55, at what time did he arrive at the bicycle shop? (2)
- 2.2.7 If the trip from the bicycle shop to his home took 6 minutes, calculate the average speed, in metres per minute, at which John cycled. (2)

Use the formula:

$$\text{Average speed} = \frac{\text{distance travelled}}{\text{time}} \quad (3)$$

- 2.3 TABLE 1 below shows the approximate number of South Africans living with HIV and Aids, and the number of Aids-related deaths from 2005 to 2009.

TABLE 1: Data related to population, deaths, HIV and Aids from 2005 to 2009

| YEAR | SOUTH AFRICAN POPULATION | SOUTH AFRICANS LIVING WITH HIV AND AIDS | | TOTAL DEATHS IN COUNTRY | AIDS-RELATED DEATHS | |
|------|--------------------------|---|-----------------|-------------------------|---------------------|-------------------|
| | | NUMBER | % OF POPULATION | | NUMBER | % OF TOTAL DEATHS |
| 2005 | A | 4 720 000 | 10,0 | 634 100 | 298 600 | 47,1 |
| 2006 | 47 821 700 | 4 830 000 | 10,1 | 628 600 | 289 800 | 46,1 |
| 2007 | 48 431 400 | 4 940 000 | 10,2 | 621 600 | B | 45,0 |
| 2008 | 48 653 800 | 5 060 000 | C | 602 800 | 257 500 | 42,7 |
| 2009 | 49 320 500 | 5 210 000 | 10,6 | 613 900 | 263 900 | 43,0 |

[Source: Statistics South Africa]

Use TABLE 1 to answer the following questions.

- 2.3.1 Calculate the difference in percentage of Aids-related deaths between 2005 and 2008. (2)
- 2.3.2 Calculate the following missing values:
- (a) A (3)
- (b) B, rounded off to the nearest 100 (3)
- (c) C, rounded off to ONE decimal place (3)
- 2.3.3 Determine the ratio between the total South African population during 2009 and the number of South Africans living with HIV and Aids during 2009.
- Write, rounded off to ONE decimal place, the ratio in the form **1 : ...** (3)

[33]

QUESTION 3

3.1

Each year South Africa generates income from exports (products sold to other countries). The income generated from these exports varies from year to year. Part of the income generated by exports comes from agricultural products.

The table below shows the total income from exports, as well as the percentages of the total earned from agricultural products.

TABLE 2: Relationship between South African exports of agricultural and other products

| YEAR | Total income generated by South African exports (in millions of rand) | Income generated by agricultural exports (in millions of rand) | Percentage of the total income earned by agricultural products |
|------|---|--|--|
| 2002 | 314 927 | 25 460 | 8,1 |
| 2003 | 273 127 | 22 670 | 8,3 |
| 2004 | 292 079 | 22 074 | 7,6 |
| 2005 | 326 385 | 25 458 | 7,8 |
| 2006 | 393 047 | 26 978 | 6,9 |

[Source: *South African Year Book*, 2007]

- 3.1.1 Calculate the total income generated by agricultural exports from 2002 to the end of 2006. (2)
- 3.1.2 Arrange the total incomes for the different years in ascending order. (2)
- 3.1.3 Draw a bar graph on the grid on ANNEXURE A to represent the percentage of the total income earned by agricultural products from 2002 to 2006. (5)

3.2

The use of fertilisers for crops such as mealies, sorghum, fruit and vegetables, can result in an increased harvest of these crops.

In South Africa farmers use an average of 0,65 kg of fertiliser per hectare (ha), while farmers in Egypt use an average of 4,32 kg of fertiliser per hectare, where $10\,000\text{ m}^2 = 1\text{ ha}$.

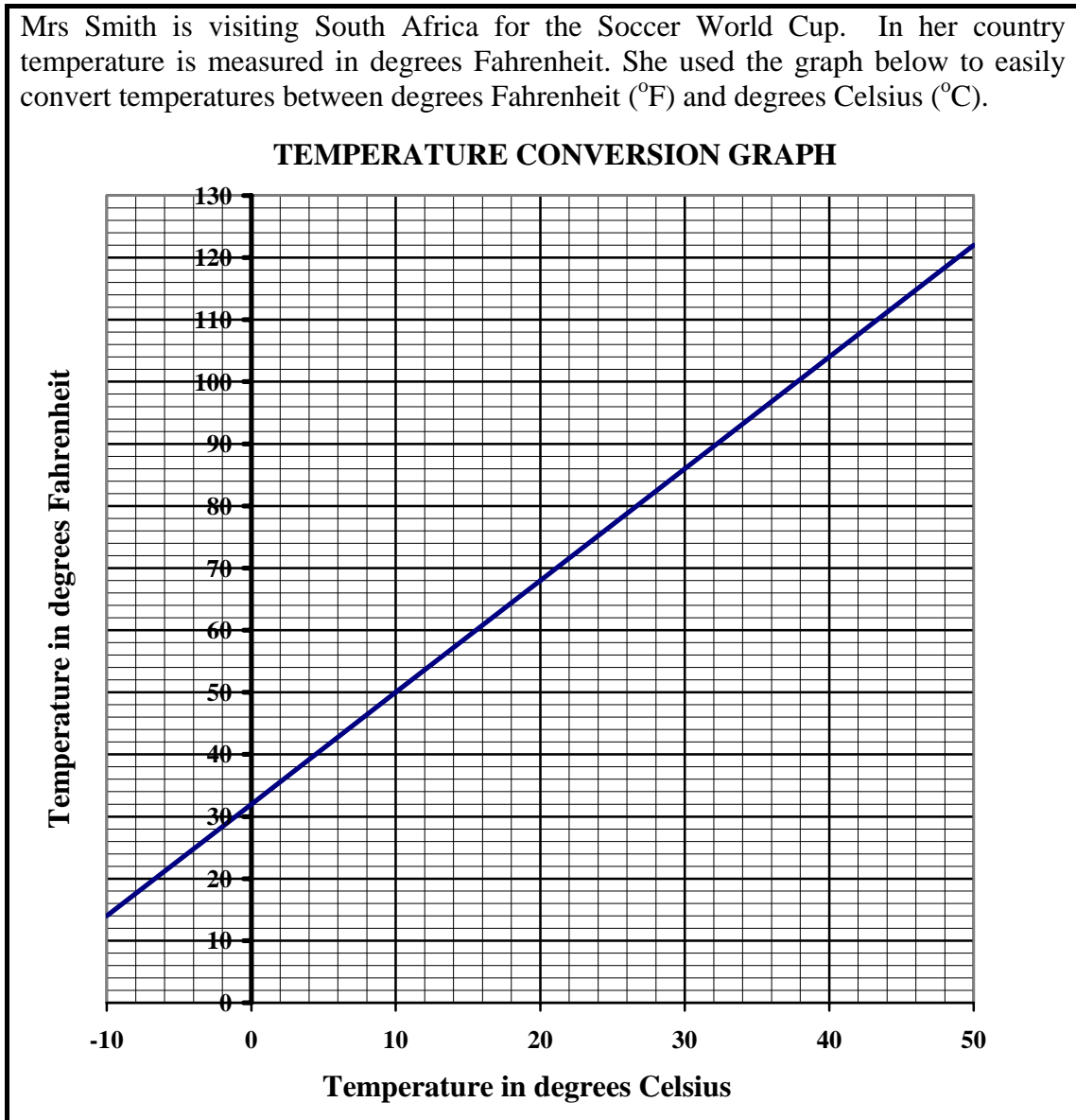
- 3.2.1 Convert 450 000 m² to hectares. (2)
- 3.2.2 Calculate the number of hectares that could be fertilised with 5 000 kg of fertiliser by a farmer in South Africa. Give the answer rounded off to the nearest hectare. (3)
- 3.2.3 Calculate the number of kilograms of fertiliser that would be needed in Egypt to fertilise 2 000 ha. (3)
- 3.2.4 Write the average amount of fertiliser used per hectare in South Africa as a percentage of the average amount of fertiliser used per hectare in Egypt. (2)

[19]

QUESTION 4

4.1

Mrs Smith is visiting South Africa for the Soccer World Cup. In her country temperature is measured in degrees Fahrenheit. She used the graph below to easily convert temperatures between degrees Fahrenheit ($^{\circ}\text{F}$) and degrees Celsius ($^{\circ}\text{C}$).



Use the graph to answer the following questions:

- 4.1.1 Is this graph representing an increasing, a decreasing or a constant function? (2)
- 4.1.2 The melting point of ice is 0°C . Write down the melting point of ice in degrees Fahrenheit. (2)
- 4.1.3 What is a temperature of 104°F in $^{\circ}\text{C}$? (2)
- 4.1.4 What is a temperature of -6°C in $^{\circ}\text{F}$? Round the answer off to the nearest degree. (3)
- 4.1.5 On a particular day, the minimum temperature was -2°C and the maximum temperature was 17°C . Determine the temperature range for that day. (3)

4.2 Mrs Smith and her touring party decide to visit an indoor swimming pool.

4.2.1 The entrance fee for the swimming pool is:

- R3,50 for children under 12 years and pensioners
- R6,50 for adults and children 12 years and older

There are four children under 12 years, five pensioners and ten adults in the group who visit the swimming pool.

Calculate the total entrance fee paid by the group.

Use the formula:

$$\text{Total entrance fee} = (\text{number of children} + \text{pensioners}) \times \mathbf{R3,50} + (\text{number of adults}) \times \mathbf{R6,50} \quad (3)$$

4.2.2 The circular kiddies pool at the indoor pool has a diameter of 5 m. There is a protective fence around the perimeter of the pool.

Determine the perimeter of the fence.

Use the formula:

$$\text{Perimeter} = \pi \times \text{diameter}, \text{ and using } \pi = 3,14 \quad (2)$$

4.2.3 The kiddies pool is filled with 6 000 ℓ of water. Mrs Smith wanted to know what this volume of water would be in gallons.

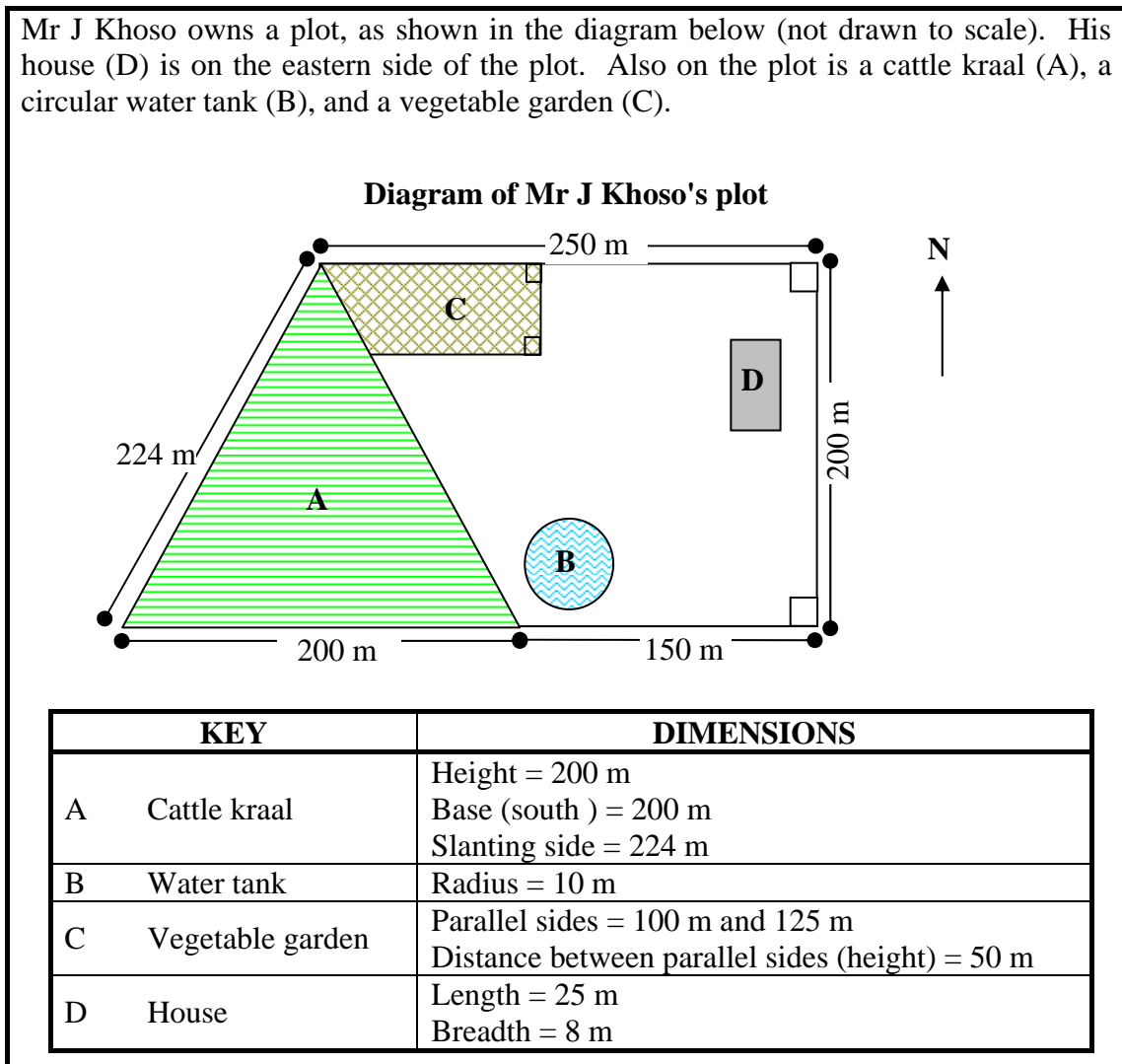
Convert the volume of water in the pool into gallons if 1 gallon = 4,546 ℓ.

(2)
[19]

QUESTION 5

5.1

Mr J Khoso owns a plot, as shown in the diagram below (not drawn to scale). His house (D) is on the eastern side of the plot. Also on the plot is a cattle kraal (A), a circular water tank (B), and a vegetable garden (C).



5.1.1 Give the general direction of the water tank from the house. (1)

5.1.2 Determine the perimeter of Mr Khoso's plot. (3)

5.1.3 Calculate the volume of water in the circular water tank, if the height of the water in the tank is 2 m.

Use the formula:

Volume = $\pi \times (\text{radius})^2 \times \text{height}$, and using $\pi = 3,14$ (3)

5.1.4 Determine the area of the cattle kraal. (3)

Use the formula:

Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$ (3)

5.1.5 Calculate the total area of Mr Khoso's plot. (4)

Use the formula:

Area of a trapezium = $\frac{1}{2} \times (\text{sum of the parallel sides}) \times \text{height}$ (4)

5.2

Mr Khoso grows cabbages and carrots in his vegetable garden. He sells them in boxes.

TABLE 3 shows the relationship between the number of cabbages and carrots in each box.

TABLE 3: Relationship between the number of cabbages and carrots in each box

| | | | | | |
|--------------------|----|----------|----|----------|-----|
| Number of boxes | 1 | 2 | 5 | B | 15 |
| Number of cabbages | 2 | 4 | 10 | 24 | 30 |
| Number of carrots | 12 | A | 60 | 144 | 180 |

5.2.1 The average mass of a cabbage is 2 kg and the average mass of a carrot is 0,12 kg. Calculate the total average mass of the cabbages and carrots in one box. (2)

5.2.2 Determine the following missing values:

(a) **A** (2)

(b) **B** (2)

5.2.3 A customer placed an order for a number of boxes of vegetables which contained a total of 12 cabbages. How many carrots in total were included in these boxes? (2)

[22]

QUESTION 6

Mr Francis sold two different types of souvenirs during the Soccer World Cup: key rings and coffee mugs. He kept a daily record of the number of items sold for each type.

TABLE 4 represents the number of items sold daily during the first two weeks of the tournament.

TABLE 4: Number of items sold during the first two weeks of the tournament

| ITEM SOLD | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 | Day 8 | Day 9 | Day 10 | Day 11 | Day 12 | Day 13 | Day 14 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Key rings | 25 | 55 | 37 | 34 | 37 | 37 | 46 | 37 | 37 | 40 | 33 | 37 | 37 | 40 |
| Coffee mugs | 25 | 26 | 27 | 29 | 35 | 35 | 35 | 35 | 37 | 37 | 37 | 37 | 38 | 38 |

6.1 Use TABLE 4 above to answer the following questions.

6.1.1 Calculate the mean (average) number of key rings sold daily. (3)

6.1.2 Suppose one of the days is chosen at random, what is the probability that 37 key rings were sold on that day? (Write the answer as a common fraction in the simplest form.) (3)

6.1.3 For the number of coffee mugs sold, determine the following:

(a) The range (2)

(b) The mode (2)

(c) The median (2)

6.2 **Mr Francis buys the key rings for R4,80 each and the coffee mugs for R7,00 each. He sells each key ring for R7,00 and each coffee mug for R10,00.**

6.2.1 Calculate Mr Francis' income if he sold 128 key rings. (2)

6.2.2 Mr Francis' income for the items sold in the third week of the tournament is given in the table below.

TABLE 5: Income from items sold during the third week

| ITEM SOLD | DAY OF WEEK | | | | | | |
|------------|-------------|-------|-------|-------|-------|-------|-------|
| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 |
| Key ring | R175 | R385 | R259 | R231 | R259 | R259 | R322 |
| Coffee mug | R250 | R350 | R370 | R380 | R270 | R350 | R370 |

(a) ANNEXURE B already shows the graph representing the daily income from the sale of key rings.

Draw a second line graph on ANNEXURE B to represent the daily income from the sale of the coffee mugs. Clearly label your graph. (8)

(b) Use the table or the graphs to determine on which day his income from the sale of key rings was greater than his income from the sale of coffee mugs. (2)
[24]

TOTAL: 150

CENTRE NUMBER:

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

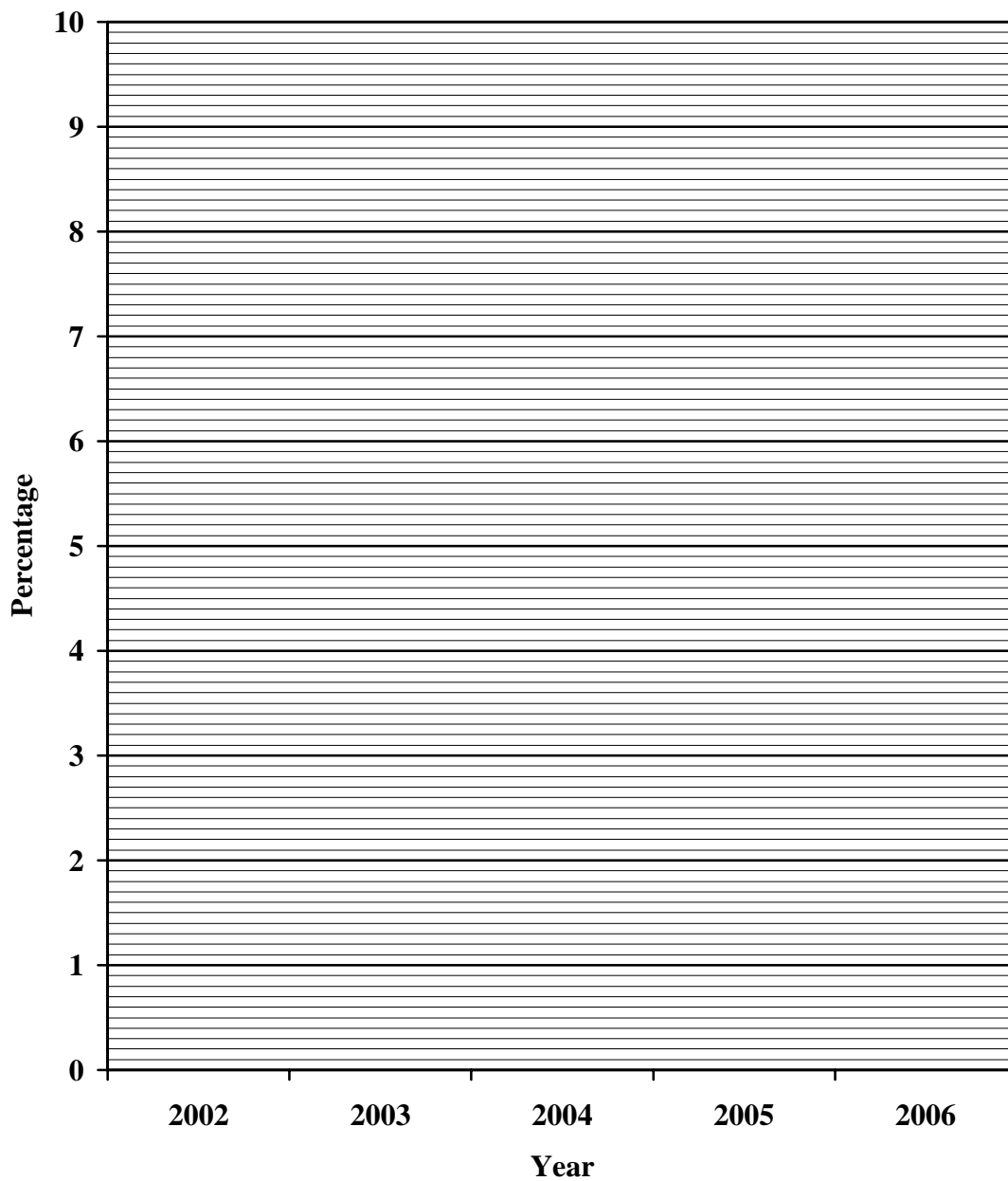
EXAMINATION NUMBER:

| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|

ANNEXURE A

QUESTION 3.1.3

**PERCENTAGE OF THE TOTAL INCOME EARNED
BY AGRICULTURAL PRODUCTS**



CENTRE NUMBER:

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

EXAMINATION NUMBER:

| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|

ANNEXURE B

QUESTION 6.2.2(a)

INCOME FROM ITEMS SOLD DURING THE THIRD WEEK

