

**JUNE EXAMINATION
GRADE 12**

2023

MATHEMATICAL LITERACY

(PAPER 1)

TIME: 2 hours

MARKS: 100

9 pages and an addendum of 3 pages




INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use the ADDENDUM as follows:
Use ANNEXURE A for QUESTION 2.1
Use ANNEXURE B for QUESTION 4.3
3. Number your answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations clearly.
7. Round-off ALL final answers appropriately according to the given context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.




QUESTION 1

- 1.1 Use the information below and VAT at the percentage (%) prescribed by the South African Revenue Service to answer the questions that follow.



'mens sana in corpore sano'

'A healthy mind in a healthy body'



South African schools' tuck shops are encouraged to sell fruit and other healthy products during breaks. TABLE 1 below shows some facts relating to Krugersdorp High School (KHS) tuck shop which sells fruit at school during breaks and lunch times.

TABLE 1: KHS TUCK SHOP'S SALES

| 80 apples per box | Cost of one apple | Selling price of one apple | Profit on one apple |
|--------------------------|--------------------------|-----------------------------------|----------------------------|
| 7 boxes sold daily | R 1,40 VAT inclusive | R2,00 VAT inclusive | A |

- 1.1.1 What does the acronym VAT represent and at what percentage is VAT calculated by the South African Revenue Service? (4)
- 1.1.2 Explain the meaning of a *VAT inclusive price*. (2)
- 1.1.3 Determine the value of **A**, the profit on one apple. (2)
- 1.1.4 Calculate the percentage profit that KHS's tuck shop makes on ONE apple.

Use the following formula:

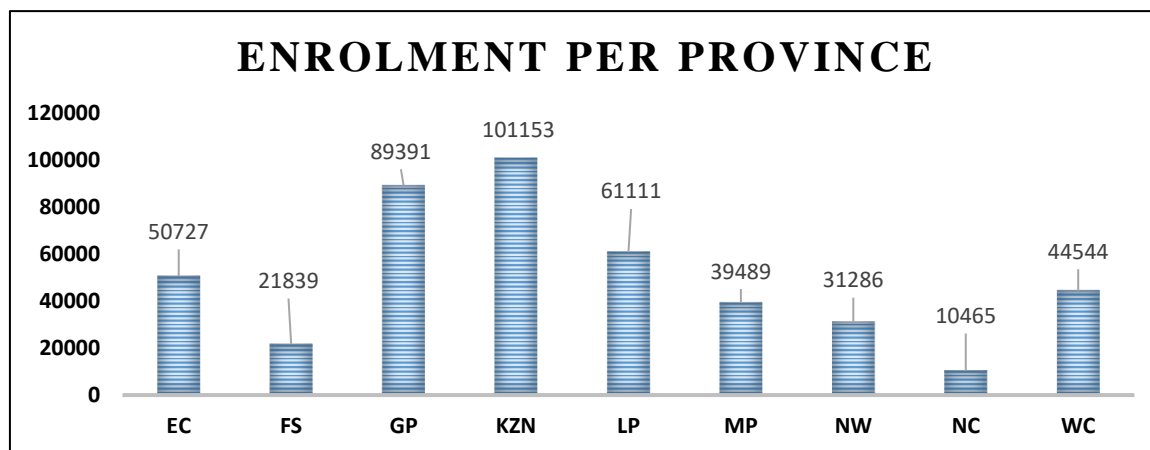
$$\% \text{ Profit} = \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\% \quad (2)$$

- 1.1.5 Calculate KHS's tuck shop's daily profit from the sale of apples. (2)

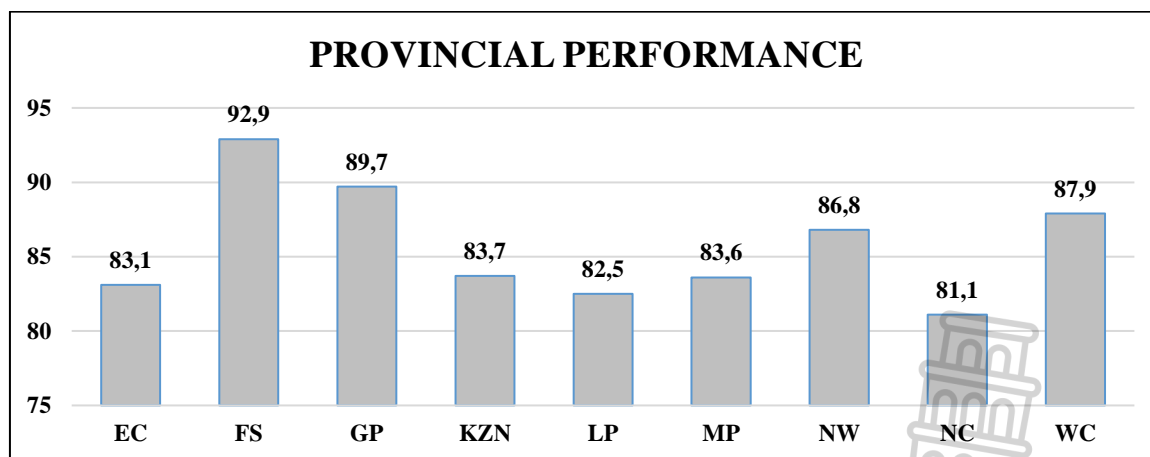
- 1.2 The year 2022 was a challenging one for matric candidates due to the COVID-19 pandemic which they had faced during 2020 and 2021.

Graph 1 below shows the enrolment of the 2022 candidates who wrote the National Senior Certificate Examination in each province. Graph 2 below shows the pass percentage per province in 2022.

GRAPH 1: NUMBER OF CANDIDATES PER PROVINCE



GRAPH 2: PASS PERCENTAGE PER PROVINCE



- 1.2.1 Why is the above information represented by a bar graph instead of a histogram? (4)
- 1.2.2 Calculate the total number of candidates who wrote the 2022 National Senior Certificate Examinations. Write your answer in words. (4)
- 1.2.3 Which province has the second highest number of candidates and has also achieved the second highest pass percentage in performance? (2)
- 1.2.4 How many candidates failed the National Senior Certificate examination in KwaZulu-Natal (KZ-N) in 2022? (3)

[25]


QUESTION 2

- 2.1 Individuals and companies with bank accounts are allowed to request statements on their accounts, mostly weekly, monthly, and quarterly.

TEBA Bank Savings Account Statement for the period 09/09/2022 to 16/09/2022 is shown in ANNEXURE A.

Use ANNEXURE A to answer the questions that follow.

- 2.1.1 Write down the account number and name of the account holder. (4)
- 2.1.2 Determine the total number of transactions made on this account. (2)
- 2.1.3 Determine the probability of choosing a transaction made on 15/09/2022. (2)
- 2.1.4 Calculate the total amount of all four TUIB transactions made on this account. (2)
- 2.1.5 The account holder owed the bank a certain amount on a particular day. Identify the amount that the account holder owed the bank. (2)
- 2.1.6 Calculate the total amount deposited into this account during the period of the statement. (2)
- 2.1.7 What percentage of the total amount deposited into this account was paid towards the Westbank Bond? (3)
- 2.1.8 Calculate the Pre-Paid Water fee on 16/09/2022. (2)
- 2.2 Merafong municipality encourages its residence to use water sparingly. Mr. Dromedaries tries to minimise his usage of municipal water and plans to install a wall water tank to collect rainwater. Study the quotation below and answer the questions that follow.



Quotation for installing water tank

| WESTONARIA PLUMBING PROJECTS PTY (LTD) | |
|---|----------------|
| 3233 President Street Westonaria | |
| ITEM | PRICE PER UNIT |
| Wall tank | R6 479,00 |
| Extra equipment and material | R971,85 |
| Labour per hour or part thereof | R64,99 |

Mr Dromedaries found out that the installation will take 2 hours 35 minutes on the first day and 1 hour 54 minutes on the second day.

Mr Dromedaris has a total budget of R7 800 to buy and install the water tank.

Verify, using calculations, whether his budget will be sufficient.

(6)
[25]

QUESTION 3

The Gauteng Department of Education bought scientific calculators for all its education districts. The distribution of calculators among these districts is represented in the table below.

TABLE 2: NUMBER OF CALCULATORS DISTRIBUTED

| Grade | NUMBER OF CALCULATORS | | | | |
|----------------------|--------------------------------|--------|--------|--------------|--------|
| | Further Education and Training | | | Senior Phase | |
| | 10 | 11 | 12 | 8 | 9 |
| Districts | | | | | |
| Ekurhuleni North | 9 000 | 8 000 | 7 852 | 11 670 | 10 340 |
| Ekurhuleni South | 12 000 | 11 200 | 10 080 | 15 622 | 14 323 |
| Gauteng East | 7 000 | 6 500 | 6 365 | 9 760 | 8 876 |
| Gauteng North | 3 000 | 2 000 | 1 645 | 5 290 | 4 449 |
| Gauteng West | 7 000 | 6 500 | 6 374 | 9 230 | 8 100 |
| Johannesburg Central | 8 000 | 7 000 | 6 930 | 10 000 | 9 568 |
| Johannesburg East | 6 000 | 5 900 | 5 873 | 8 950 | 7 772 |
| Johannesburg North | 6 000 | 5 800 | 5 773 | 8 050 | 7 500 |
| Johannesburg South | 6 000 | 5 900 | 5 815 | 8 100 | 7 679 |
| Johannesburg West | 5 000 | 4 800 | 4 561 | 7 200 | 6 923 |
| Sedibeng East | 3 000 | 2 700 | 2 463 | 5 238 | 4 576 |
| Sedibeng West | 6 000 | 5 000 | 4 899 | 8 690 | 7 640 |
| Tshwane North | 7 000 | 6 800 | 6 562 | 9 800 | 8 823 |
| Tshwane South | 9 000 | 8 500 | 8 246 | 11 200 | 10 060 |
| Tshwane West | 7 000 | 6 000 | 5 953 | 9 067 | 8 990 |

- 3.1 How many education districts received calculators? (2)
- 3.2 Determine the total number of calculators bought by the Gauteng Department of Education for Grade 9 learners. (2)
- 3.3 Name the district that was allocated the THIRD LOWEST number of calculators for Grade 12 learners. (2)

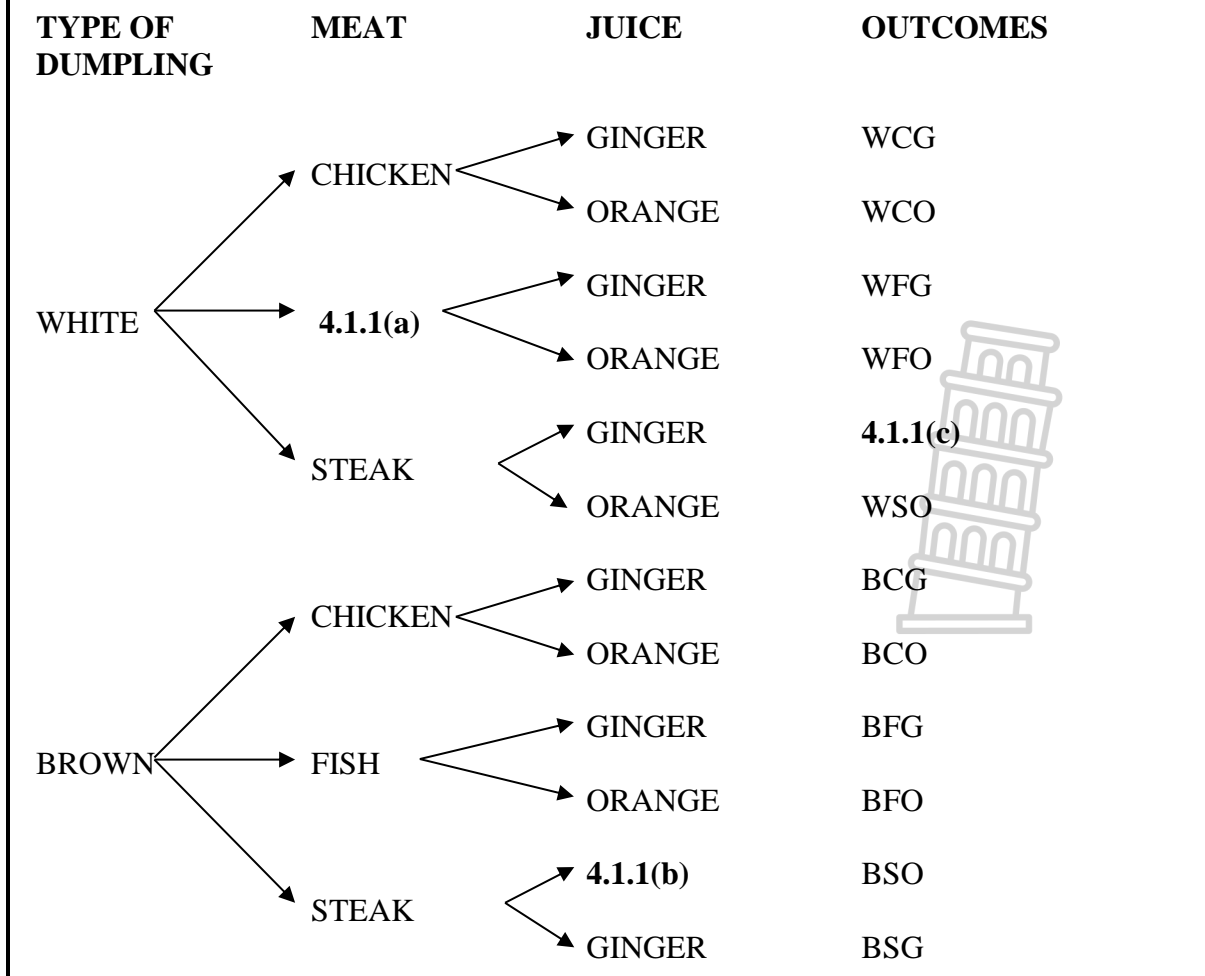
- 3.4 Is the data represented in TABLE 2 above continuous or discrete? Explain your answer. (4)
- 3.5 Determine the mean number of calculators bought for the Grade 10 learners in only the Johannesburg Districts. (3)
- 3.6 Use the “Number of calculators” column for Grade 11 and answer the following questions.
- (a) Determine the first quartile and third quartile. Thereafter, subtract quartile 1 from quartile 3. What is the answer? (6)
 - (b) Name the concept calculated in QUESTION 3.6 (a). (2)
- [21]**

QUESTION 4

4.1 Mr Shishenga rewards the top 10 Grade 12 learners every term by taking them to different restaurants. Sakhumzi restaurant offers a special dumpling combo with fruit juice for R60,00.

The dumpling dough can be either white (W) or brown (B). The meat filling can be chicken (C), fish (F) or steak (S). The juice choice is ginger (G) or orange (O).

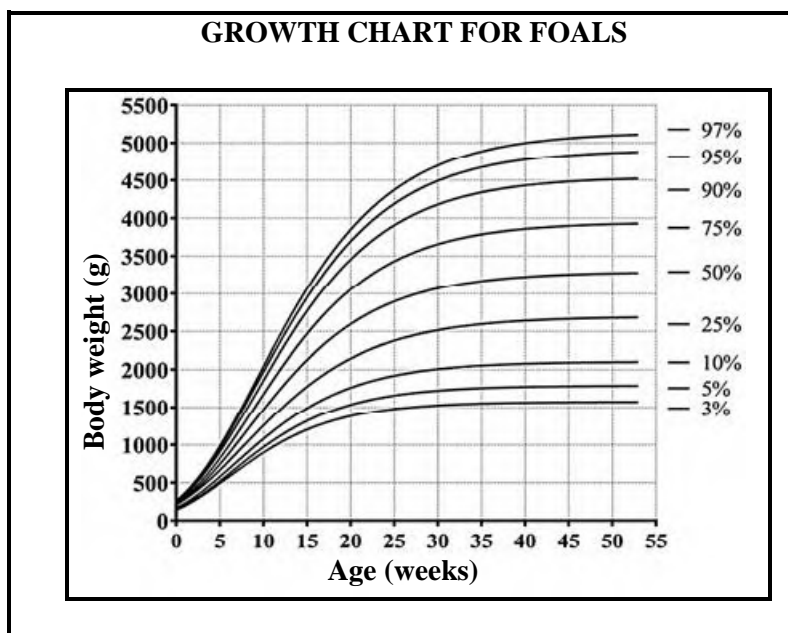
The tree diagram below represents the different choices for this special offer.



Use the information above to answer the questions that follow.

- 4.1.1 Write down the missing information for 4.1.1(a), 4.1.1(b) and 4.1.1(c). (3)
- 4.1.2 Determine how many different combinations from which a person has to choose. (2)
- 4.1.3 Write down the probability of randomly choosing a combination that will have steak as the meat and ginger juice as the beverage. (2)

- 4.2 Mr Areef is a professional horse breeder. He is highly concerned that his foals (baby horses) might not run as fast as possible due to being overweight. Below is the growth chart for the foals.



Use the information on the growth chart to answer the following questions.

- 4.2.1 Determine the weight of a 30-week-old foal that is in the 25th percentile. (2)
- 4.2.2 Explain what it means if a foal's weight is classified in the 75th percentile. (2)
- 4.2.3 Mr Areef's foal is 40 weeks old. Write its age in months if there are 4 weeks in a month. (2)
- 4.2.4 One of Mr Areef's foals weighs 4,5 kg at 45 weeks.
- (a) Determine in which percentile its age-weight ratio is. (2)
- (b) Give advice to Mr Areef with regard to his foal's weight. (2)

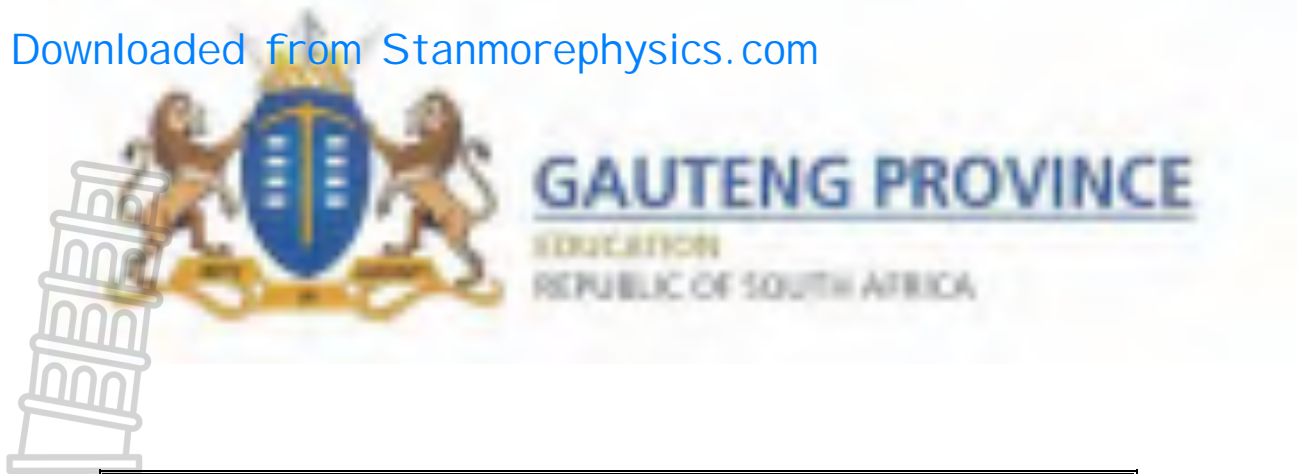
- 4.3 Mr Shishenga, a 50-year-old Mathematical Literacy educator at Ekurhuleni North High School, earned a monthly taxable income of R35 357,00 during the 2021/22 tax year. During this time, Mr Shishenga was a member of a medical fund for himself, his wife and his two children.

ANNEXURE B shows the tax table for the 2021/22 tax year. Use the TAX TABLE in ANNEXURE B to answer the questions that follow.

- 4.3.1 Determine Mr Shishenga's annual taxable income. (2)
- 4.3.2 Show, with calculations, that Mr Shishenga will receive R13 344 in medical tax credits for the 2021/22 tax year. (4)
- 4.3.3 Calculate the amount of tax Mr Shishenga must pay for the 2021/22 tax year. (6)
- [29]

TOTAL: 100





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MATHEMATICAL LITERACY

(PAPER 1)


ADDENDUM

3 pages



ANNEXURE A

QUESTION 2.1

|  | TEBA Bank Savings Account Statement | 2 Palladium St, Carletonville 2499 018 487 1340 | | |
|--|--|--|------------|-------------|
| From: 09/09/2022 To: 16/09/2022 | | | | |
| Mr A. Dromedaries 2290 Falcon Street Carltonville 2499 ID Number: 860927 5371 084 Account Number: 84 848 1976 Client Number: 101 1019 | | | | |
| Details | Debit (R) | Credit (R) | Date | Balance (R) |
| Balance brought forward | | | | 54,31 |
| TUIB Payment to Tuff Lady | 20,00 | | 09/09/2022 | 34,31 |
| Purchase | 63,98 | | 13/09/2022 | 29,67- |
| Salary 007 | | 382,14 | 14/09/2022 | 352,47 |
| Salary 008 | | 22 695,98 | 15/09/2022 | 23 048,45 |
| Salary 009 | | 191,07 | 15/09/2022 | 23 239,52 |
| TUIB Transfer to Thys | 2 400,00 | | 15/09/2022 | 20 839,52 |
| TUIB Payment to Maarten | 1 000,00 | | 15/09/2022 | 19 839,52 |
| TUIB Payment to Nicolaas | 600,00 | | 15/09/2022 | 19 239,52 |
| Credit Card | 2 361,52 | | 15/09/2022 | 16 878,00 |
| Insurance 458 | 500,00 | | 15/09/2022 | 16 378,00 |
| Insurance 459 | 532,75 | | 15/09/2022 | 15 845,25 |
| WESTBANK Bond | 5 569,75 | | 15/09/2022 | 10 275,50 |
| Insurance 503 | 801,23 | | 15/09/2022 | 9 474,27 |
| Pre-Paid Water | 100,00 | | 16/09/2022 | 9 374,27 |
| Car repayment | 3 168,79 | | 16/09/2022 | 6 205,48 |
| ##Pre-Paid Water Fee | ... | | 16/09/2022 | 6 204,38 |
| Planet Fitness | 289,00 | | 16/09/2022 | 5 915,38 |
| End | | | | |
| NB: Transaction means any debits or credits on the account. | | | | |
| TUIB > Transactions Using Internet Banking | | | | |
| ## These fees are inclusive of VAT at 15% | | | | |

ANNEXURE B
QUESTION 4.3
TAX RATES FOR 2021/22 TAX YEAR

| TAX BRACKET | TAXABLE INCOME | TAX RATES (in R) |
|--------------------|-----------------------|---|
| 1 | 1 – 216 200 | 18% of taxable income |
| 2 | 216 201 – 337 800 | 38 916 + 26% of taxable income above 216 200 |
| 3 | 337 801 – 467 500 | 70 532 + 31% of taxable income above 337 800 |
| 4 | 467 501 – 613 600 | 110 739 + 36% of taxable income above 467 500 |
| 5 | 613 601 – 782 200 | 163 335 + 39% of taxable income above 613 600 |
| 6 | 782 201 – 1 656 600 | 229 089 + 41% of taxable income above 782 200 |
| 7 | 1 656 601 and above | 587 593 + 45% of taxable income above 1 656 600 |

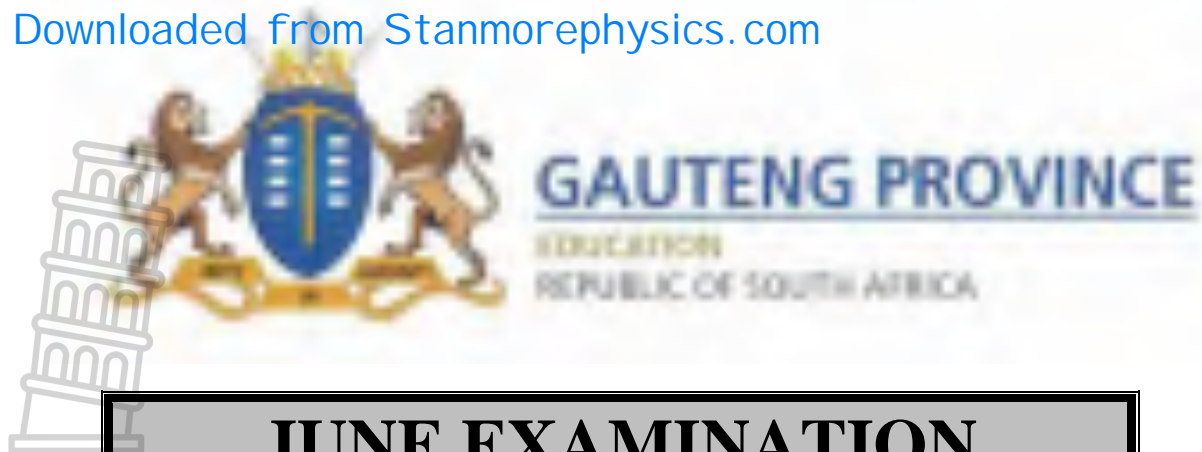
[Adapted from www.sars.gov.za]

Table 8 below shows the tax rebates and medical tax credits for the 2021/22 tax year.

TAX REBATES AND MEDICAL TAX CREDITS FOR THE 2021/22 TAX YEAR

| TAX REBATES | |
|--------------------------------------|---------|
| Primary | R15 714 |
| Secondary (65 and older) | R8 613 |
| Tertiary (75 and older) | R2 871 |
| MEDICAL TAX CREDITS PER MONTH | |
| Main member | R332 |
| First member | R332 |
| Each additional member | R224 |

[Adapted from www.sars.gov.za]



JUNE EXAMINATION GRADE 12

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MARKING GUIDELINES

MATHEMATICAL LITERACY

(PAPER 1)

| Codes | Explanation |
|----------|--|
| M | Method |
| MA | Method with accuracy |
| CA | Consistent accuracy |
| A | Accuracy |
| C | Conversion |
| D | Define |
| J | Justification/Reason/Explain |
| S | Simplification |
| RT/RD/RG | Reading from a table/graph/diagram/map/plan |
| F | Choosing the correct formula |
| SF | Substitution in a formula |
| O | Opinion |
| P | Penalty, e.g. for no units, incorrect rounding-off, etc. |
| R | Rounding-off |
| NP | No penalty for rounding-off OR omitting units |
| AO | Answer only |

KEY TO TOPIC SYMBOLS:

M = Measurement; MP = Maps, Plans and other representations; P = Probability

8 pages

NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Question 1 sub-questions can be allocated full marks if learners write the answers only (AO).
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled version).
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra incorrect item presented.



QUESTION 1

| Q | Solution | Explanation | Marks | Level |
|-----|---|--|-------|-------|
| 1.1 | 1.1.1 Value Added Tax ✓✓A 15% ✓✓A | 2A correct answer 2A correct percentage | (4) | F1 |
| | 1.1.2 VAT inclusive price means the price has the VAT value already added. ✓✓J OR The price already includes the VAT. ✓✓J | 2A justification 2A justification | (2) | F1 |
| | 1.1.3 Profit for one apple = R2,00 – R1,40 ✓M = R0,60 ✓A | 1M subtraction for profit 1A correct answer | (2) | F1 |
| | 1.1.4 $\% Profit = \frac{0,6}{1,4} \times 100 \% \checkmark M$ = 42,857 % ✓CA OR $\% Profit = \frac{60}{140} \times 100 \% \checkmark M$ = 42,857 % ✓CA | 1M division and multiplication by 100 1CA answer 1M division and multiplication by 100 1CA answer | (2) | F1 |
| | 1.1.5 KHS's tuck shop's profit = $7 \times 80 \times 0,60 \checkmark M$ = R336,00 ✓A | 1M multiplying all correct values. 1A correct answer | (2) | F1 |
| 1.2 | 1.2.1 A bar graph is used for comparison of discrete variables and categorical data, ✓✓J while a histogram is used for distribution of non-discrete variables and quantitative data. ✓✓J | 2J bar graph explanation 2J histogram explanation | (4) | DH1 |
| | 1.2.2 Total number of candidates = 50 727 + 21 839 + 89 391 + 101 153 + 61 111 + 39 489 + 31 286 + 10 465 + 44 544 ✓MA = 450 005 ✓CA Four hundred and fifty thousand and five ✓✓A | 1MA adding all correct values 1CA answer 2A correct answer NPU | (4) | DH1 |

| | | | | |
|-------|--|---|------|-----|
| 1.2.3 | Gauteng Province ✓✓A OR GP ✓✓A | 2A correct answer | (2) | DH1 |
| 1.2.4 | Failed Percentage = $100\% - 83,7\%$ ✓A = 16,3% Then $16,3\% \times \checkmark\text{MA } 101\,153 = 16\,487,939$ = 16 488 candidates ✓R | 1A correct subtraction value 1MA multiplying correct values 1R correct rounding off | (3) | DH1 |
| | | | [25] | |

QUESTION 2

| Q | Solution | Explanation | Marks | Level |
|-----|---|--|-------|-------|
| 2.1 | 2.1.1 Account Number: 84 848 1976 ✓✓A Account Holder: Mr. A. Dromedaries ✓✓A | 2A correct account with all digits 2A correct name | (4) | F1 |
| | 2.1.2 17 transactions ✓✓A | 2A correct answer Accept: 15 transactions | (2) | F1 |
| | 2.1.3 Probability = $\frac{10}{17}$ ✓A ✓A | CA from 2.1.2 1A correct numerator 1A correct denominator | (2) | P2 |
| | 2.1.4 Total amount = $20 + 2\,400 + 1\,000 + 600$ ✓MA = R4 020 ✓A | 1MA addition of correct values 1A answer | (2) | F2 |
| | 2.1.5 Amount owed = R29,67 ✓✓RT | 2RT correct values | (2) | F2 |
| | 2.1.6 Total amount deposited = $382,14 + 22\,695,98 + 191,07$ ✓MA = R23 269,19 ✓CA | 1MA adding correct values 1CA answer | (2) | F2 |
| | 2.1.7 Total credited amounts = $382,14 + 22\,695,98 + 191,07$ 23 269,19 ✓S Percentage = $\frac{5\,569,75}{23\,269,19} \times 100\%$ ✓MA = 23,94 % ✓CA | 1S adding all the values 1MA calculating percentage 1CA correct answer NPR & NPU | (3) | F3 |

| | | | | | |
|--|-------|---|--|-------------|----|
| | 2.1.8 | Pre-paid water fee $= R6\ 205,48 - R6\ 204,38 \checkmark M$ $= R1,10 \checkmark A$ | 1M subtracting correct amounts 1A correct answer | (2) | F3 |
| | 2.2 | Labour day 1 = 3 hours \times 64,99 $= R194,97 \checkmark M$ Day 2 = 2 hours \times 64,99 $= R129,98 \checkmark CA$ Total = $R194,97 + R129,98$ $= R324,95 \checkmark CA$ Cost of installing the tank $= R6\ 479,00 + R971,85 + R324,95$ $= R7\ 775,80 \checkmark CA$ Amount above = $R7\ 800 - R7\ 775,80$ $= R24,20 \checkmark CA$ (Surplus) Mr. Dromedaries' budget is sufficient. $\checkmark O$ | 1M 1 st day labour calculation 1CA 2 nd day labour calculation 1CA adding 2 day values 1CA total costs 1CA simplification 1O verification | (6) | F4 |
| | | | | [25] | |



QUESTION 3

| | Q | Solution | Explanation | Marks | Level |
|-----|-------|--|---|-------------|-------|
| 3.1 | 3.1.1 | 15 ✓✓RT | 2RT correct number of districts | (2) | DH2 |
| | 3.1.2 | Total number of calculators = 10 340 + 14 323 + 8 876 + 4 449 + 8 100 + 9 568 + 7 772 + 7 500 + 7 679 + 6 923 + 4 576 + 7 640 + 8 823 + 10 060 + 8 900 ✓MA = 125 619 ✓CA | 1MA adding correct values 1CA correct answer | (2) | DH2 |
| | 3.1.3 | Johannesburg West ✓✓RT | 2RT correct district name | (2) | DH1 |
| | 3.1.4 | Discreet ✓✓A The data is given in whole numbers only. ✓✓J OR The data can be counted per item. ✓✓J | 2A correct choice 2J reason | (4) | DH4 |
| | 3.1.5 | Mean = $\frac{8\,000 + 6\,000 + 6\,000 + 6\,000 + 5\,000}{5}$ ✓RT = $\frac{31\,000}{5}$ ✓MA = 6 200 ✓CA | 1RT all correct values 1MA mean concept 1CA answer | (3) | DH2 |
| | 3.1.6 | Ascending order ✓MA (a) 2 000; 2 700; 4 800; 5 000 ; 5 800; 5 900; 5 900; 6 000 ; 6 500; 6 500; 6 800; 7 000 ; 8 000; 8 500; 11 200 Q2 = 6 000 ✓RT Q1 = 5 000 ✓RT Q3 = 7 000 ✓RT Q3 – Q1 ✓F 7 000 – 5 000 = 2 000 ✓A | 1MA correct arrangement 1RT firstly identifying correct value of Q2 1RT correct value of Q1 1RT correct value of Q3 1F correct formula 1A correct answer | (6) | DH2 |
| | | (b) Interquartile Range ✓✓A OR IQR ✓✓A | 2A correct term | (2) | DH1 |
| | | | | [21] | |

| | | | | | |
|-----|-------|--|---|------------|----|
| 4.3 | 4.3.1 | Annual taxable income $= R35\,357,00 \times 12 \checkmark \mathbf{MA}$ $= R424\,284 \checkmark \mathbf{A}$ | 1MA multiplying by 12 1A simplification | (2) | F1 |
| | 4.3.2 | Monthly medical tax credits $= (R332 \times 2) \checkmark \mathbf{RT} + (R224 \times 2) \checkmark \mathbf{M}$ $= R664 + R448 \checkmark \mathbf{M}$ $= R1\,112$ \therefore Yearly MTC $= R1\,112 \times 12 \checkmark \mathbf{MA}$ $= R13\,344$ | 1RT correct values 1M multiplying by 2 1M adding 1MA multiplying by 12 | (4) | F3 |
| | 4.3.3 | Annual tax = $\checkmark \mathbf{A}$ $R70\,532 + 31\% \text{ of taxable income above } 337\,800$ $\checkmark \mathbf{SF}$ $= R70\,532 + 31\% (R424\,284 - R337\,800)$ $= R70\,532 + (31\% \times R86\,484) \checkmark \mathbf{CA}$ $= R70\,532 + R26\,810,04$ $= R97\,342,04 \checkmark \mathbf{CA}$ Tax payable $\checkmark \mathbf{MCA}$ $= R97\,342,04 - R15\,714 - R13\,344$ $= R68\,284,04 \checkmark \mathbf{CA}$ | 1A correct tax bracket 1SF correct substitution 1CA simplification 1CA tax before rebates 1MCA subtracting both rebates 1CA simplification | (6) | F3 |
| | | | | [29] | |
| | | | TOTAL: | 100 | |