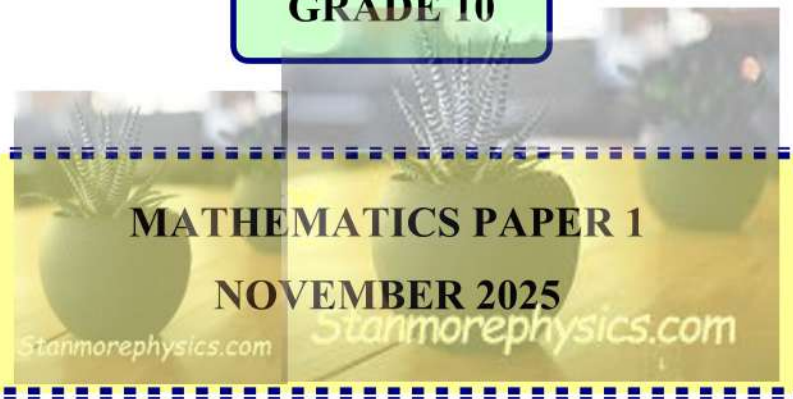
KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10



MATHEMATICS PAPER 1

NOVEMBER 2025

MARKS: 100

TIME: 2 hours

This question paper consists of 8 pages, including an information sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 7 questions.
2. Answer ALL the questions.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
5. Answers only will NOT necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
8. Write neatly and legibly.

Stanmorephysics.com

QUESTION 1

1.1 Simplify the following completely:

1.1.1 $(2x-3)(2x+3)$ (2)

1.1.2 $-5x(2x-1)^2+3$ (3)

1.1.3 $\dfrac{(2^x)^3.27^x}{8^x.(3^2)^x.3^x}$ (3)

Stanmorephysics.com

1.2 Factorise the following expressions fully:

1.2.1 $2p^2-p-15$ (2)

1.2.2 $y-b+by-1$ (3)

1.2.3 $5m^3-40$ (3)

1.3 Calculate the value of the following, WITHOUT the use of a calculator:

$$\frac{2010\times(2013^2-9)\times 2012}{2016\times(2011^2-1)}$$ (4)

[20]

QUESTION 2

2.1 Solve for x **without using a calculator:**

2.1.1 $2^{3x-4} = \frac{1}{512}$ (3)

2.1.2 $\frac{4}{x-5} - \frac{10}{x} = \frac{2}{x^2-5x}$ (4)

2.2 At a school event, tickets are sold at two different prices: R20 for adults and R12 for learners. A total of 20 tickets were sold, collecting R320 in total. How many adult tickets and learner tickets were sold?

Let the number of adult tickets be x and the number of learner tickets be y. (6)

[13]

QUESTION 3

3.1 The n^{th} term of an arithmetic sequence is given as $T_n = 7n-3$.

3.1.1 Determine the first term of the sequence. (1)

3.1.2 Which term is equal to 683? (3)

3.2 A grade 10 learner wrote the word **WHEAT** over and over again on a piece of paper as follows:

WHEATWHEATWHEATWHEATWHEAT……..

3.2.1 Write down the 30th letter. (1)

3.2.2 Determine the 508th letter. (3)

3.2.3 The first H is in the second position, the second H is in the seventh position, the third H is in the twelfth position, and so forth. Determine in which position the 103rd H is? (3)

Stanmorephysics.com

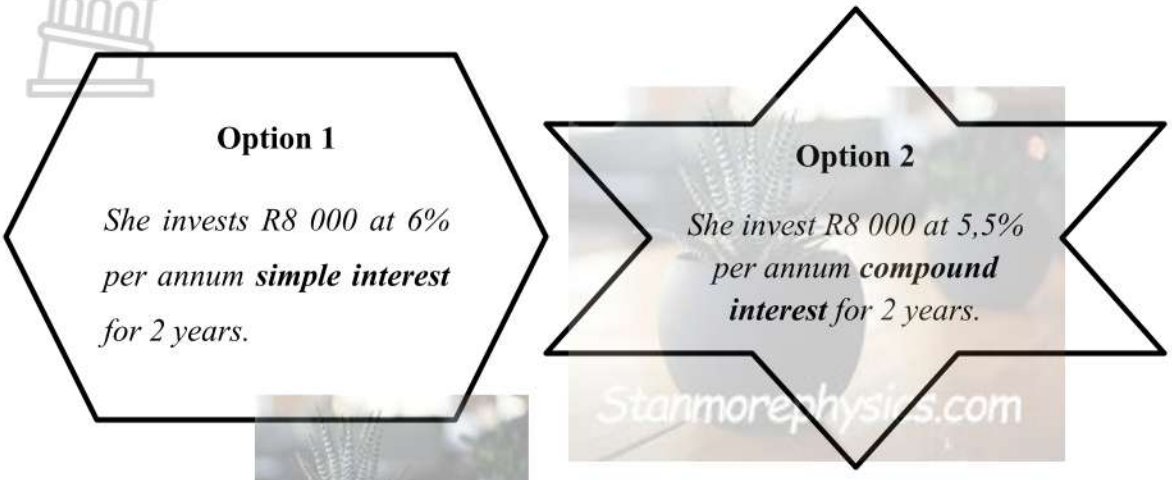
3.3 Consider the number pattern: $-3\times1;-7\times4;-11\times7;-15\times10$.

Determine the 62nd term of the above pattern. (4)

[15]

QUESTION 4

Amanda is planning a trip to England in 2 years. She considers two different ways to save her money.



4.1 Calculate the total amount Amanda will have after 2 years if she chooses the 2nd option. (2)

4.2 Which option gives Amanda a better return after 2 years? Show calculations to support your answer. (3)

4.3 If the exchange rate is £1 = R22,50. How many British pounds (£) will she have after 2 years if she chooses the better option? (2)

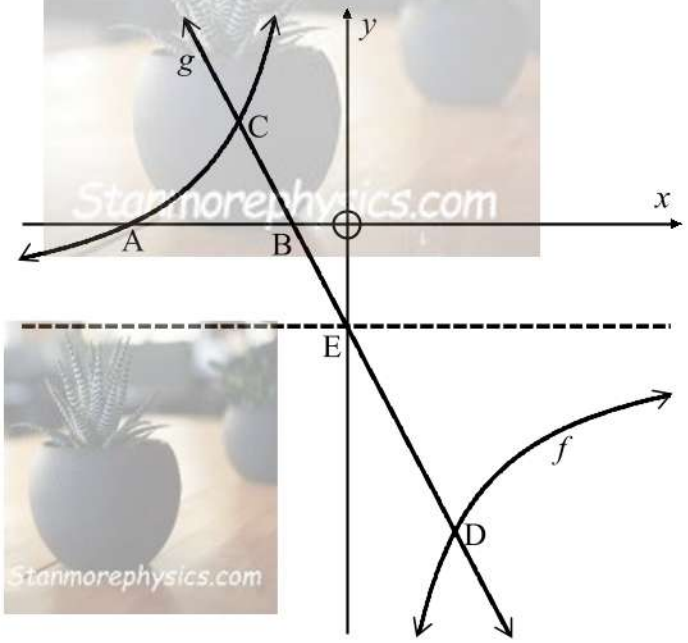
4.4 Suppose instead she wants to use option 1, but save monthly. If the bank agrees to let her save a fixed amount every month for 2 years, and she wants a total of R9 000, calculate the fixed monthly payment.

(*Assume the interest is only calculated on the total of all deposits at the end of 2 years*) (3)

[10]

QUESTION 5

5.1 Sketched below are the graphs of $f(x)=-\frac{2}{x}-1$ and $g(x)=-2x-1$. Points A and B are x-intercepts of f and g respectively. E is the y-intercept of g. C and D are the points of intersection of f and g.



5.1.1 Write down:

a) the y-coordinate of E. (1)

b) the equation of the vertical asymptote of f. (1)

5.1.2 Determine the coordinates of B. (2)

5.1.3 Calculate the length of AB. (4)

5.1.4 Determine the coordinates of C and D. (5)

5.1.5 Determine the value(s) of x for which:

a) f is increasing. (1)

b) $\frac{g(x)}{f(x)} \leq 0$ (3)

5.1.6 If $h(x)=f(-x)+3$. Describe in words the transformation from f to h. (2)

5.2 Use the following properties to sketch the graph of p if $p(x) = a \times b^x + q$:

- $a > 0$
- $0 < b < 1$
- $q < 0$

(3)

[22]

QUESTION 6

Given: $m(x) = -2x^2 + 8$

6.1 Determine the x – intercepts of m. (2)

6.2 Sketch the graph of m. (3)

6.3 Determine the value(s) of k for which $m(x) = k$ will have no solution. (1)

6.4 Determine the maximum value of $3^{m(x)-5}$. (2)

[8]

QUESTION 7

7.1 If P(D) = 0,25 ; P(K) = 0,5 and P(D or K) = 0,625

7.1.1 Calculate P(D and K). (2)

7.1.2 Are events D and K complementary? Give a reason. (2)

7.2 A survey was conducted among 100 learners to determine their participation in two subjects: **Maths (M)** and **Life Orientation (LO)**. The following results were obtained:

- 42 learners participate in Maths.
- 35 learners participate in Life Orientation.
- x learners participate in both subjects.
- 38 learners did not participate at all.

7.2.1 Draw a Venn diagram to represent the above information. (3)

7.2.2 Determine the number of learners who participated in both subjects. (2)

7.2.3 Determine the probability that a learner selected at random participates in:

a) Neither Maths nor LO. (1)

b) Maths or LO. (1)

c) Maths only. (1)

[12]

TOTAL MARKS: 100

INFORMATION SHEET: MATHEMATICS

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$A = P(1+ni) \qquad A = P(1-ni) \qquad A = P(1-i)^n \qquad A = P(1+i)^n$$

$$T_n = a + (n-1)d \qquad S_n = \frac{n}{2}\left[2a + (n-1)d\right]$$

$$T_n = ar^{n-1} \qquad S_n = \frac{a\left(r^n - 1\right)}{r-1} \;;\; r \neq 1 \qquad S_\infty = \frac{a}{1-r} \;;\; -1 < r < 1$$

$$F = \frac{x\left[(1+i)^n - 1\right]}{i} \qquad P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$$

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \qquad \text{M}\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$$

$$y = mx + c \qquad y - y_1 = m(x - x_1) \qquad m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \tan\theta$$

$$(x-a)^2 + (y-b)^2 = r^2$$

Stanmorephysics.com

In ΔABC:

$$\frac{a}{\sin \text{A}} = \frac{b}{\sin \text{B}} = \frac{c}{\sin \text{C}}$$

$$a^2 = b^2 + c^2 - 2bc.\cos A$$

$$\text{area}\,\Delta\text{ABC} = \frac{1}{2}ab.\sin \text{C}$$

$$\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta \qquad \sin(\alpha - \beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$

$$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta \qquad \cos(\alpha - \beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$\cos 2\alpha = \begin{cases} \cos^2\alpha - \sin^2\alpha \\ 1 - 2\sin^2\alpha \\ 2\cos^2\alpha - 1 \end{cases} \qquad \sin 2\alpha = 2\sin\alpha.\cos\alpha$$

$$\bar{x} = \frac{\sum x}{n} \qquad \sigma^2 = \frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2}{n}$$

$$\text{P(A)} = \frac{n(\text{A})}{n(\text{S})} \qquad \text{P(A or B)} = \text{P(A)} + \text{P(B)} - \text{P(A and B)}$$

$$\hat{y} = a + bx \qquad b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

Copyright reserved