



education

Department of  
Education  
FREE STATE PROVINCE

**GRADE 11**

**MATHEMATICS**

**2026 JUNE EXAMINATION**

**PAPER 1**

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**MARKS: 100**

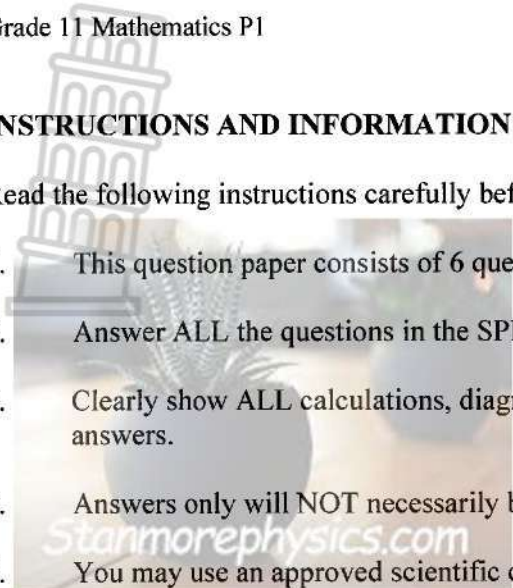
**HOURS: 2 HOURS**

**This question paper consists of 6 pages and a formula sheet**

**INSTRUCTIONS AND INFORMATION**

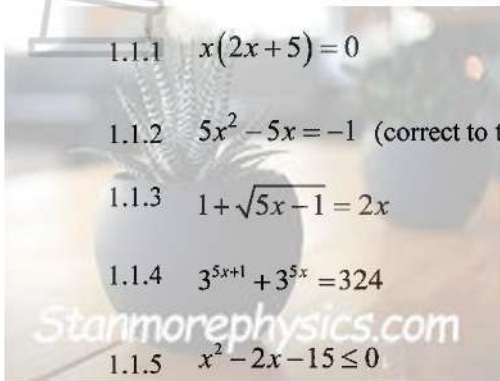
Read the following instructions carefully before answering the questions.

1. This question paper consists of 6 questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless otherwise stated.
6. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
7. Diagrams are not necessarily drawn to scale.
8. An information sheet with formulae is included at the end of the question paper.
9. Write neatly and legibly.



**QUESTION 1**

1.1 Solve for  $x$ :



1.1.1  $x(2x+5) = 0$

1.1.2  $5x^2 - 5x = -1$  (correct to two decimal places)

1.1.3  $1 + \sqrt{5x-1} = 2x$

1.1.4  $3^{5x+1} + 3^{5x} = 324$

1.1.5  $x^2 - 2x - 15 \leq 0$

(2)

(4)

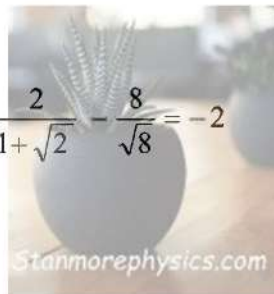
(5)

(4)

(4)

1.2 Solve simultaneously for  $x$  and  $y$ :

$$y + x = 2 \quad \text{and} \quad -2x^2 + 3xy = y^2$$



$$\frac{2}{1+\sqrt{2}} - \frac{8}{\sqrt{8}} = -2$$

(6)

1.3 Without using a calculator, prove that:

$$\frac{2}{1+\sqrt{2}} - \frac{8}{\sqrt{8}} = -2$$

(4)

**[29]**

**QUESTION 2**

2.1 Simplify the following without using a calculator:

2.1.1  $\sqrt[3]{81} \cdot (\sqrt[3]{3})^{-4}$  (5)

2.1.2  $\frac{2 \cdot 3^{x-1} + 3^{x+1}}{11 \cdot 6^x}$  (4)

2.1.3  $\frac{(2^2 \cdot 3)^{x+1}}{2^{2x} \cdot 3^x}$  (3)

2.2 The quadratic equation  $x^2 - 4ax + 2b + 1 = 0$ , where  $a$  and  $b$  are constants, has no real

solutions. Prove that  $b > 2a^2 - \frac{1}{2}$ . (4)

2.3 If  $P(x) = \frac{\sqrt{3x-1}}{x+3}$ , determine the value(s) of  $x$  for which:

2.3.1  $P(x) = 0$ . (2)

2.3.2  $P(x)$  is undefined. (2)

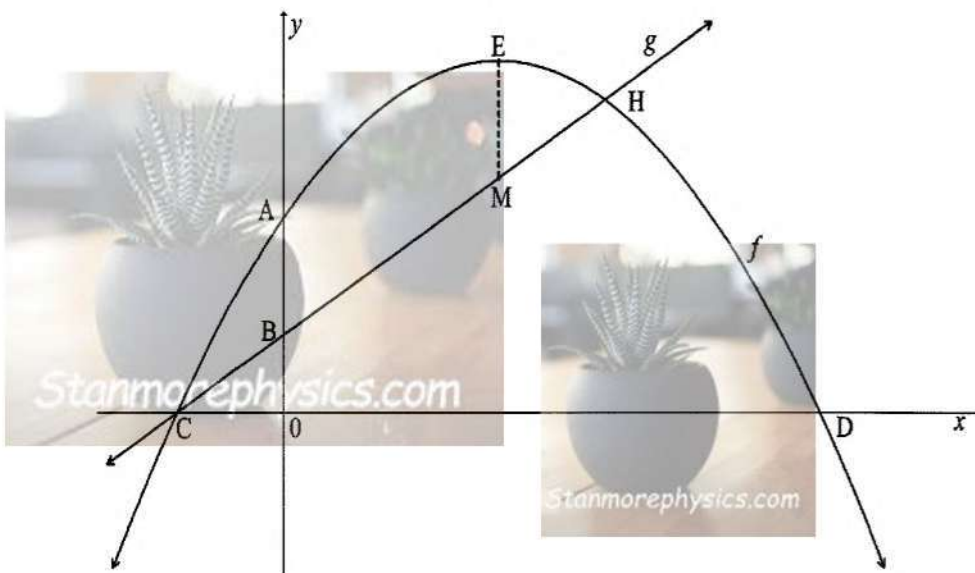
2.3.3  $P(x)$  is non real. (2)

2.4 Given:  $(\sqrt{6p} + \sqrt[4]{128})(\sqrt{6p} - \sqrt[4]{128}) = 54 + a\sqrt{2}$  (4)  
Calculate  $a - p$ .

**[26]**

**QUESTION 3**

The graphs of  $f(x) = a(x + p)^2 + q$  and  $g(x) = 4x + 8$  are drawn below. A and B are the  $y$  intercepts of  $f$  and  $g$  respectively. C and D are the  $x$  intercepts of  $f$ . A straight line,  $g$ , intersects  $f$  at C and H. E is the turning point of  $f$ . EM is parallel to the  $y$  axis with point M on  $g$ .



- 3.1 If E is the point  $(4 ; 36)$ , write down the coordinates of D. (4)
- 3.2 Write down the values of  $x$  where  $f$  is decreasing. (1)
- 3.3 Determine the equation of  $f$  in the form  $f(x) = a(x + p)^2 + q$  (4)
- 3.4 Determine the length of AB. (3)
- 3.5 Determine the length of EM. (2)
- 3.6 If H is the point  $(6 ; 32)$ , Write down the values of  $x$  for which  $g(x) > f(x)$ . (2)
- 3.7 For which value(s) of  $k$  will  $f$  and  $h$  not intersect if  $h(x) = g(x) + k$ ? (5)

3.7 has been corrected as per ADDENDUM

**[21]**

**QUESTION 4**

Consider the graph of  $h(x) = -\frac{4}{x-2} + 4$

- 4.1 Write down the domain of  $h$ . (2)
- 4.2 Write down the range of  $h$ . (2)
- 4.3 Determine the intercepts of  $h$  with the axes. (3)
- 4.4 Determine the equation of the axis of symmetry of  $f$  with a negative gradient. (3)
- 4.5 Sketch the graph of  $h$  showing the intercepts with the axes and the asymptotes. (3)
- 4.6 Write down the values of  $x$  for which  $h(x) \geq 0$ . (3)

**[16]**

**QUESTION 5**

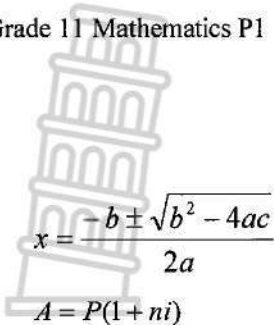
Given:  $p(x) = 3^x - 1$

- 5.1 Write down the equation of the asymptote of  $p$ . (1)
- 5.2 Write down the equation of  $t$  if  $t(x) = p(x-1) + 3$ . (2)
- 5.3 For which value(s) of  $x$  is  $p(x) \geq 8$ ? (2)
- 5.4 If the domain of  $p(x)$  is restricted to be  $x \in [-2; 3]$ , write down the range of  $p$ . (3)

**[08]**

**TOTAL: 100 MARKS**

INFORMATION SHEET/INLIGTINGSBLAD



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

$$A = P(1 + ni)$$

$$A = P(1 - ni)$$

$$A = P(1 - i)^n$$

$$A = P(1 + i)^n$$

$$T_n = a + (n - 1)d$$

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

$$T_n = ar^{n-1}$$

$$S_n = \frac{a(r^n - 1)}{r - 1}; r \neq 1$$

$$S_\infty = \frac{a}{1 - r}; -1 < r < 1$$

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

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

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

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$y = mx + c$$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \tan \theta$$

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

$$\text{In } \triangle ABC: \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

$$\text{area } \triangle ABC = \frac{1}{2}ab \cdot \sin C$$

$$\sin(\alpha + \beta) = \sin \alpha \cdot \cos \beta + \cos \alpha \cdot \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cdot \cos \beta - \cos \alpha \cdot \sin \beta$$

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

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

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

$$\sin 2\alpha = 2\sin \alpha \cdot \cos \alpha$$

$$\bar{x} = \frac{\sum x}{n}$$

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

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$\hat{y} = a + bx$$

$$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$



# education

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Name of the learner: \_\_\_\_\_

Class: \_\_\_\_\_

Name of the school: \_\_\_\_\_

**GRADE/*GRAAD* 11**

**MATHEMATICS P1**  
***WISKUNDE V1***

**JUNE 2026**

**MARKS/*PUNTE*: 100**


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**ANSWER BOOK**  
***ANTWOORD BOEK***


**QUESTION 1**

1.1		
1.1.1		(2)
1.1.2		
		(4)
1.1.3		
		(5)
1.1.4		
		(4)
1.1.5		
		(4)
1.2		
		(6)
1.3		
		(4)
		<b>[29]</b>

**QUESTION 2**

2.1.1		(5)
2.1.2		(4)
2.1.3		(3)
2.2		(4)
2.3.1		(2)
2.3.2		(2)
2.3.3		(2)
2.4		(4)
		<b>[26]</b>

**QUESTION 3**

3.1		
		(4)
3.2		(1)
3.3		
		(4)
3.4		
		(3)
3.5		(2)
3.6		(2)
3.7		
		(5)
		<b>[21]</b>

**QUESTION 4**

4.1		
		(2)
4.2		(2)
4.3		(3)
4.4		(3)
4.5		(3)
4.6		(3)
		<b>[16]</b>



