

SA EXAM PAPERS This Paper was downloaded from SAEXAMPAPERS
SA's Leading Past Year

Exam Paper Portal



You have Downloaded, yet Another Great Resource to assist you with your Studies 😊

Thank You for Supporting SA Exam Papers

Your Leading Past Year Exam Paper Resource Portal

Visit us @ www.saexampapers.co.za



**SA EXAM
PAPERS**

SA EXAM PAPERS

Proudly South African



JUNE EXAMINATION GRADE 12

2026

MATHEMATICS

(PAPER 1)

SURNAME: _____

NAME: _____

NAME OF SCHOOL: _____

DATE: _____

2

0

2

6

)

D

ANSWER ALL THE QUESTIONS IN THE QUESTION PAPER.

QUESTION	MARKER			MODERATOR		
	MARKS	MARKER'S INITIALS		MARKS	MODERATOR'S INITIALS	
1	0			0		
2	0			0		
3	0			0		
4	0			0		
5	0			0		
6	0			0		
7	0			0		
8	0			0		
9	0			0		
			TOTAL			

TIME: 3 hours

MARKS: 150

30 pages + an information sheet



SA EXAM PAPERS

Proudly South African

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 9 questions. Answer ALL the questions in the spaces provided for answers.
2. Clearly show ALL calculations, diagrams, graphs, etc. that you have used in determining your answers.
3. Answers only will NOT necessarily be awarded full marks.
4. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
5. If necessary, round-off answers to **TWO decimal places**, unless stated otherwise.
6. Diagrams are NOT necessarily drawn to scale.
7. An INFORMATION SHEET with formulae is **included** at the end of the question paper.
8. No pages may be torn from the question paper.
9. Candidates may not retain a question paper or remove it from the examination room. Question papers must be returned to the invigilator at the end of the examination session.
10. Answers must be written in black/blue ink as distinctly as possible. DO NOT write in the margins. stanmorephysics.com
11. Indicate the questions that you have answered by drawing a circle around the relevant numbers on the front cover of the question paper where marks are to be recorded.
12. Draw a neat line through any work/rough work that must NOT be marked.
13. In the event that you use the additional space provided:
 - 13.1 Write down the number of the question.
 - 13.2 Leave a line and rule off after your answer.
14. Write neatly and legibly.



SA EXAM PAPERS

Proudly South African

QUESTION 1

1.1	Solve for x :	
	1.1.1 $3x^2 - x = 0$	
		(2)
	1.1.2 $2x^2 + 6x = 6$ (Correct to TWO decimal places)	
		(4)
	1.1.3 $-x^2 - 2x \leq -8$	
		(4)



1.1.4	$2^{2x} - 2^x = 12$	(4)

1.1.5	$\sqrt{4x - 3} = x$	(4)



1.2 Solve for x and y simultaneously:

$$4^{2x+1} = 16^{\frac{y}{2}}$$

$$x^2 - 2xy = -1$$

(6)



SA EXAM PAPERS

Proudly South African

QUESTION 2

The first three terms of a quadratic pattern are:

$-12 ; -15 ; -16 ; \dots$

2.1 Write down the next two terms of the pattern.

(2)

2.2 Determine the n^{th} term of the pattern and write your answer in the form:

$$T_n = an^2 + bn + c$$

(4)



SA EXAM PAPERS

Proudly South African

2.3	Determine, which terms of the pattern are positive.	(4)
-----	---	-----

2.4	Which TWO consecutive terms in the quadratic number pattern have a first difference of 113?	(4)
-----	---	-----



QUESTION 3

3.1	<p>Given the arithmetic sequence: 5 ; 9 ; 13 ; ... ; 1001. Determine the number of terms in the sequence.</p> 	(3)
3.2	<p>Prove that for any arithmetic sequence with first term a, and a common difference d, the sum of the first n terms is given by the formula:</p> $S_n = \frac{n}{2} [2a + (n - 1)d].$ 	(4)



3.3

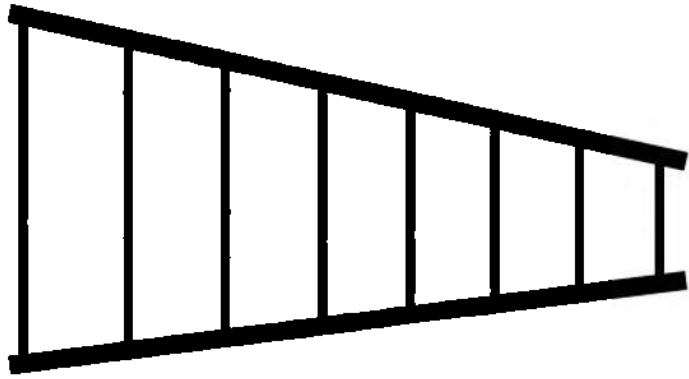
Evaluate:

$$\sum_{p=-1}^{19} (3p - 2)$$

(5)

**SA EXAM PAPERS**

Proudly South African

3.4	<p>A metal rod of 15, 9375 metres is cut into eight pieces whose lengths form a geometric sequence. The pieces are then used to support a structure. The pieces are welded vertically, starting with the longest piece, to support two metal beams as shown in the diagram below. The length of the longest piece is 128 times the length of the shortest piece.</p>	
		
If the length of the shortest piece, the 8 th piece, is x metres:		
3.4.1	<p>Write down the length of the longest piece in terms of x.</p>	(1)
3.4.2	<p>Determine the common ratio of the sequence formed by the pieces of the rod.</p>	(3)



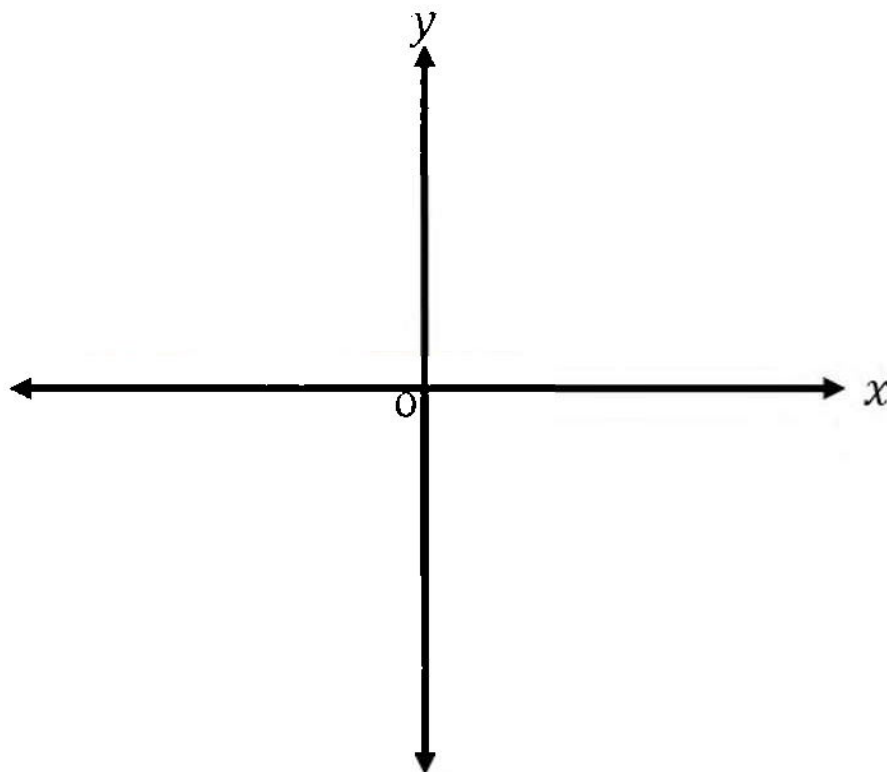
QUESTION 4

Given: $f(x) = \left(\frac{1}{3}\right)^x$

4.1 Determine the inverse of graph f and write your answer in the form $y = \dots$

(2)

4.2 Sketch the graph of f and f^{-1} . Show intercept(s) with axes and at least ONE other point on each graph.



(6)

**SA EXAM PAPERS**

Proudly South African

4.3 Determine the values of x for which $f^{-1}(x) > -3$.

(2)

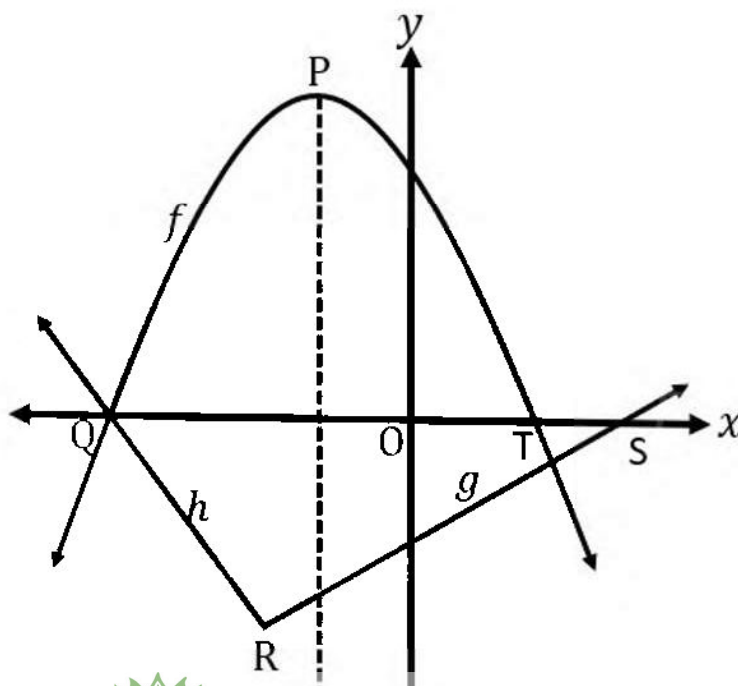
[10]

QUESTION 5

The graphs of $f(x) = -x^2 - 6x + 7$, $g(x) = \frac{1}{2}x - 4$ and $h(x) = -2x - 14$ are sketched below.

Graph f cuts the x -axis at points Q and T. Graphs g and h meet at point R.

The x -intercepts of graphs g and h are S and Q respectively. P is the turning point of graph f .



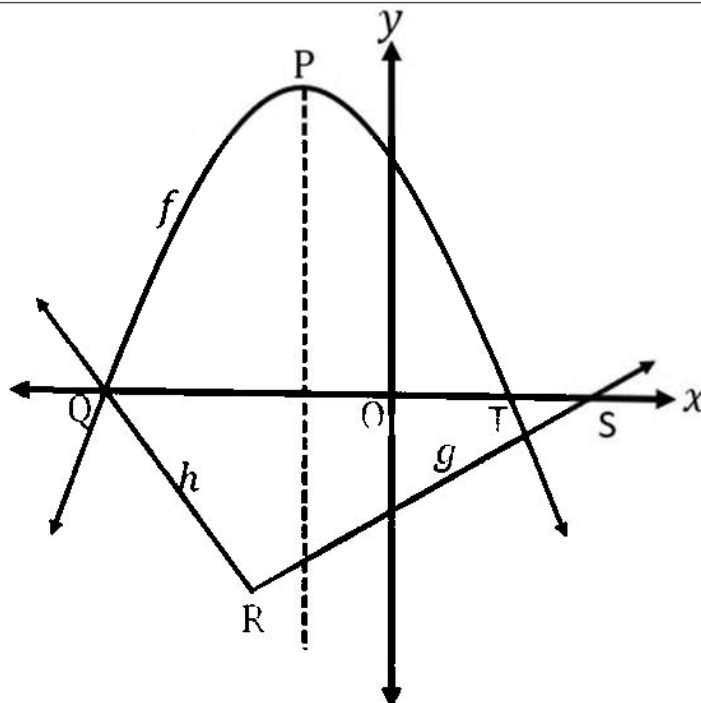
SA EXAM PAPERS

Proudly South African

5.1	Show, with necessary calculations, that graphs g and h are perpendicular to each other.	(2)
5.2	Determine the coordinates of R.	(3)
5.3	Determine the length of QT.	(3)



- 5.4 $w(x)$ is the equation of the line obtained by shifting graph g perpendicularly along graph h until it reaches point Q.



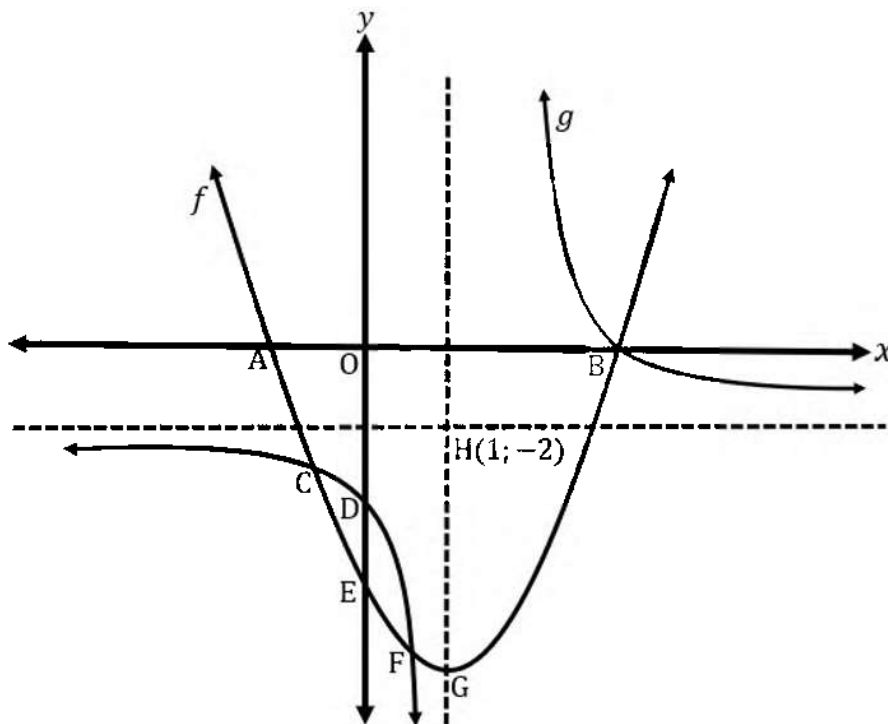
- 5.4.1 Determine the y -intercept of graph w .

(2)



QUESTION 6

The graphs of $f(x) = x^2 - 2x - 15$ and $g(x) = \frac{a}{x+p} + q$ are sketched below. The asymptotes of graph g intersect at point $H(1; -2)$. Graph f cuts the x -axis at points A and B , and intersects the y -axis at point E . Graphs f and g intersect at points B , C and F . The turning point G , of graph f lies on the vertical asymptote of graph g .



6.1 Write down the coordinates of point E.

(1)



SA EXAM PAPERS

Proudly South African

6.2	Determine the coordinates of B.	
		(3)
6.3	Determine the range of graph f .	
		(2)
6.4	Consider graph $g(x) = \frac{a}{x+p} + q$:	
	6.4.1 Write down the values of p and q .	
		(2)
6.4.2	Show that $a = 8$.	
		(3)



- 6.5 If it is further given that the x values at C and F are $x = -2,41$ and $x = 0,41$ respectively, determine the values of x for which $g(x) - f(x) > 0$.

(3)

**SA EXAM PAPERS**

Proudly South African

QUESTION 7

7.1	Determine $f'(x)$ from first principles if $f(x) = 4x^2 - 3x$.	(5)
7.2	Determine: $D_x \left[\frac{x^2 - 9}{3 - x} \right]$	(3)



7.3

Given that $y = (2x - 3)^2$, show that $\frac{dy}{dx} = 4\sqrt{y}$.

(4)

[12]**SA EXAM PAPERS**

Proudly South African

QUESTION 8

Given: $f(x) = x^3 - 3x^2 + 4$ 8.1 Determine the coordinates of the intercepts of f with the axes.

(5)

8.2 Calculate the coordinates of the turning points of f .

(4)



SA EXAM PAPERS

Proudly South African

8.5	Use your graph in QUESTION 8.3 to determine the values of p for which $f(x) = x^3 - 3x^2 + 4 + p$ will have one distinct root.	
		(2)

[17]**SA EXAM PAPERS**

Proudly South African

QUESTION 9

A school fundraising committee is planning a matric dance for the Grade 12 learners. The weekly profit P , in rand, depends on the number of teachers involved in the fundraising activities. The relationship between profit and the number of teachers is given by the formula:

$$P(x) = -2x^2 + 160x + 19\,600, \text{ where } x \text{ is the number of teachers.}$$

9.1 Determine the profit when 5 teachers are involved in the fundraising.

(2)

9.2 Calculate the number of teachers that would **need to** be involved in the fundraising activities to achieve a maximum profit. Show **ALL** your working.

(4)

9.3 Determine the maximum profit that the committee can make.

(2)

[8]



SA EXAM PAPERS

Proudly South African

INFORMATION SHEET: MATHEMATICS

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

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

$$\sum_{i=1}^n i = \frac{n(n+1)}{2}$$

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

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

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

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

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

$$\text{Area of } \Delta ABC = \frac{1}{2} ab \cdot \sin C$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\sum_{i=1}^n 1 = n$$

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

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

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

$$y = mx + c$$

$$m = \tan \theta$$

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



SA EXAM PAPERS

Proudly South African