Downloaded from Stanmorephysics.com

Confidential

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

Stanmorephysics.com

MATHEMATICS P1

NOVEMBER 2025

Stanmorephysics.com

MARKS: 150

TIME: 3 hours

This question paper consists of 11 pages, 1 information sheet and an answer book of 23 pages.

Copyright reserved

Downloaded from Stanmorephysics.com

INSTRUCTIONS AND INFORMATION

Read the following instructions and information carefully before answering the questions.

1. This question paper consists of 11 questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show ALL calculations, diagrams, graphs, etc. that 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 stated otherwise.
6. If necessary, round off answers 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.

Copyright reserved

Downloaded from Stanmorephysics.com
NSC Confidential

QUESTION 1

1.1 Solve for x:

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

1.1.2 $5x^2+2=-9x$ (correct to TWO decimal places) (4)

1.1.3 $8x^2>2x$ (4)

1.1.4 $2.2^{2x}-9.2^x+4=0$ (4)

1.1.5 $\sqrt{\sqrt{\frac{1}{x}}+2}=\frac{1}{\sqrt{x}}$ (5)

1.2 Calculate the values of x and y if:

- x is the sum of 2 and y
- Five times the product of x and y, is 6 more than the square of x (6)

[25]

QUESTION 2

2.1 Given the infinite geometric series: $(t+10)+(t-2)+(t+4)+\ldots$

2.1.1 Show that $t=-2$ (3)

2.1.2 Calculate the value of T_{25}. Write your answer in the form $T_n=b^x$ (3)

2.1.3 Calculate the sum of the infinite series. (2)

2.2 Given $\sum_{p=k}^{117}(4p-1)=26\,675$

2.2.1 Write down the difference between T_6 and T_{14} (2)

2.2.2 Calculate the value of k. (5)

[15]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

QUESTION 3

The depth of a torpedo below sea level forms a quadratic pattern, where 0 metres is at sea level. A submarine tracked a torpedo in one-second intervals.

The depth (in metres) that the torpedo reached is given in the table below.

	Depth (in metres)
At the end of the first second	36
At the end of the first 2 seconds	71
At the end of the first 3 seconds	104

3.1 Calculate the depth of the torpedo at the end of the first 5 seconds. (2)

3.2 Show that the depth of the torpedo at the end of n seconds was $T_n = -n^2 + 38n - 1$ (3)

3.3 Calculate the maximum depth that the torpedo reached. (3)

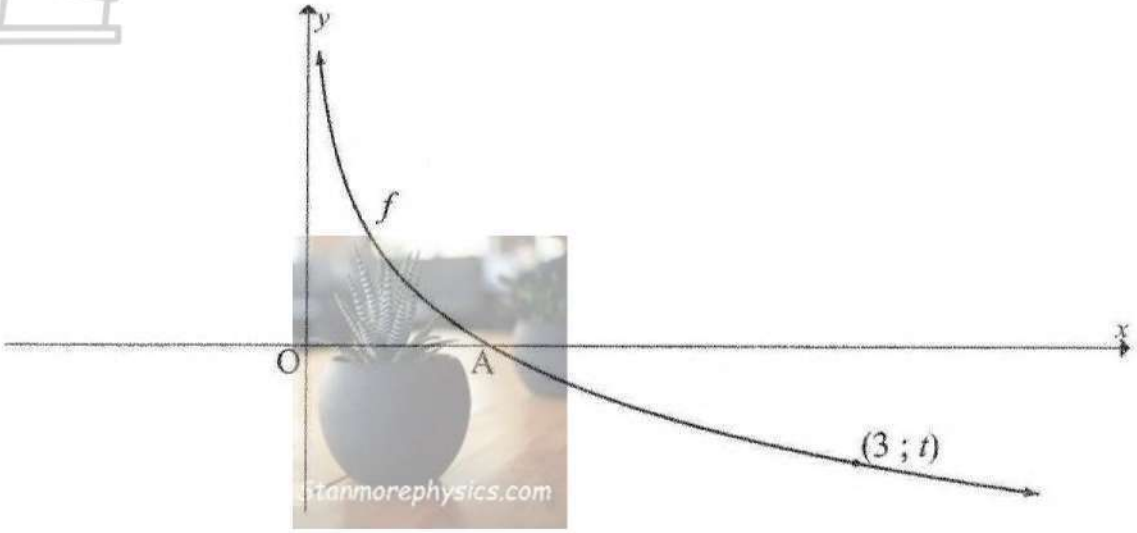
3.4 After how many seconds was the torpedo at 104 m below sea level for the second time? (2)

[10]

Downloaded from Stanmorephysics.com

QUESTION 4

The graph of $f(x) = \log_{\frac{1}{3}} x$ is drawn below. Point A is the x-intercept of f and $(3 ; t)$ lies on f.



4.1 Calculate the value of t (1)

4.2 Write down the coordinates of A. (1)

4.3 Determine the equation of f^{-1}, the inverse of f, in the form $y = \ldots$ (2)

4.4 Write down the equation of the asymptote of f^{-1} (1)

4.5 Draw the graph of f^{-1} on the set of axes provided in the ANSWER BOOK. Clearly indicate the intercepts with the axes, the coordinates of ONE other point and the asymptotes. (3)

4.6 The graph of h is obtained when f^{-1} is translated 5 units to the right. Determine the y-values of h where $x > 4$. (2)
[10]

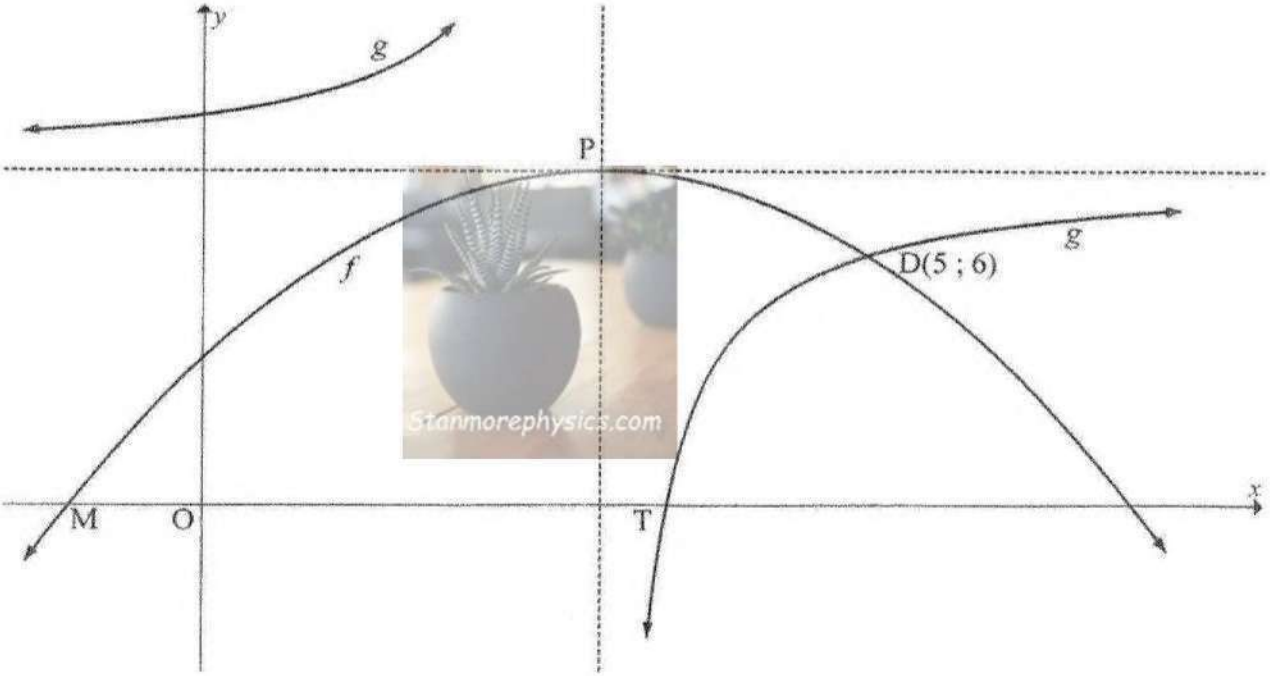
Stanmorephysics.com

Downloaded from Stanmorephysics.com
NSC Confidential

QUESTION 5

The graphs of $f(x)=ax^2+bx+c$ and $g(x)=\frac{-4}{x-3}+8$ are drawn below.

P is the turning point of f and the point of intersection of the asymptotes of g.
The graphs intersect at D(5 ; 6). M and T are x-intercepts of f and g respectively.



5.1 Write down the domain of g. (1)

5.2 Write down the range of f. (1)

5.3 Determine the values of x for which:

5.3.1 $g(x) \leq f(x)$ (2)

5.3.2 $f(x) < 6$ (2)

5.4 Show that the equation of the parabola is $f(x)=-\frac{1}{2}x^2+3x+\frac{7}{2}$ (3)

5.5 Calculate the length of MT. (6)

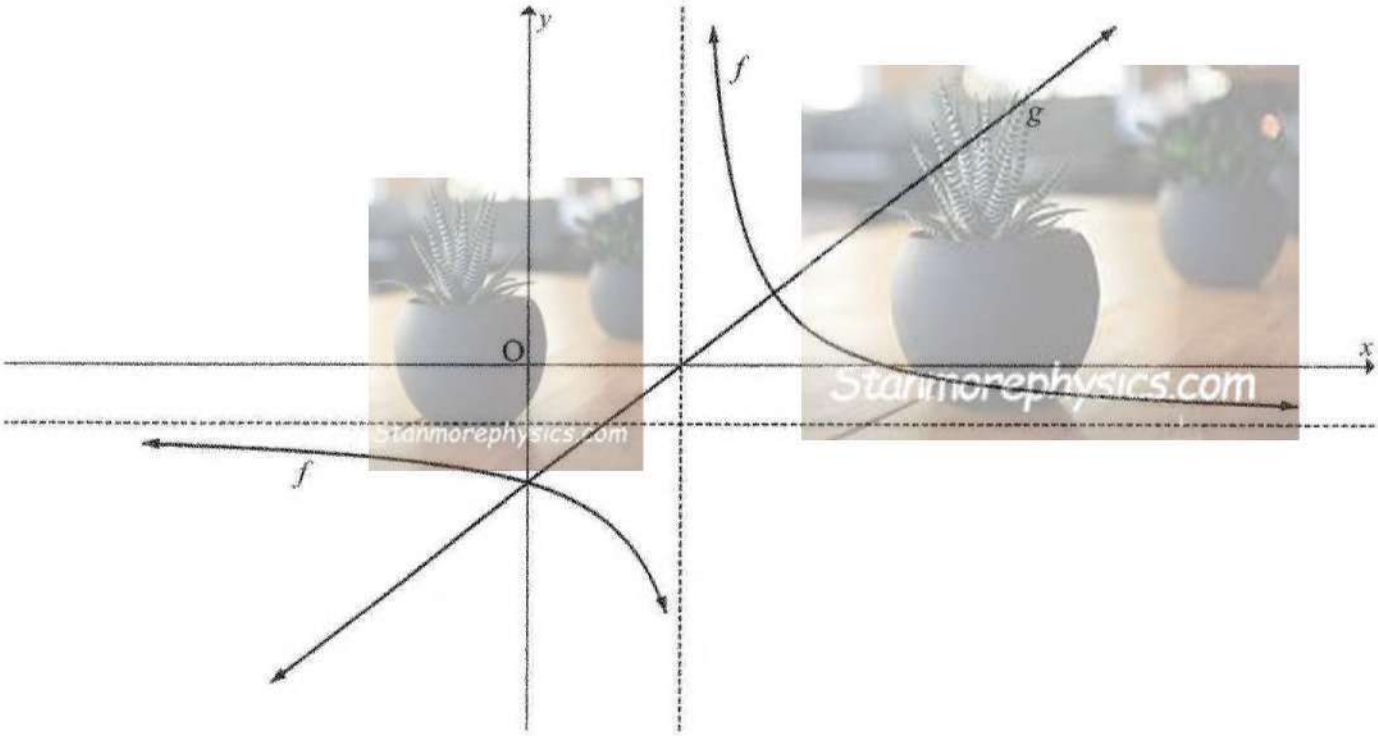
5.6 Determine the equation of the tangent to f at D. (3)
[18]

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 6

The graphs of $g(x) = x + c$ and $f(x) = \frac{a}{x+p} + q$ are drawn below. Graph g and the vertical asymptote of f intersect at the x-axis.



6.1 Write down the coordinates of the x-intercept of g in terms of p. (1)

6.2 Graph g intersects the horizontal asymptote of graph f at $x = 1$ and the graph f at $x = 3$. Graphs f and g also intersect on the y-axis. Determine the equation of f. (5)

6.3 Describe the transformation that g must undergo to become an axis of symmetry of f that cuts f at two points. (2)
[8]

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 7

7.1 A travel company informs Robert that a holiday to a certain destination costs R40 000 now. The company predicts that the cost of this holiday will increase by 7,8% per annum. What will this holiday cost in 5 years' time? (2)

7.2 Sarah opened a savings account that paid interest at a rate of 5,8% p.a., compounded quarterly. She deposited R2 300 into the account on 1 January 2020 and continued to make deposits of R2 300 at the beginning of each quarter thereafter. She made her last deposit on 1 October 2025. Calculate the accumulated amount in the account on 1 January 2026. (4)

7.3 The bank granted Rajesh a loan of R900 000 on 28 February 2024 at an interest rate of 6,8% p.a., compounded monthly.

7.3.1 Rajesh was unable to make the first three payments. He made his first repayment of R10 000 on 30 June 2024. He continued to make monthly repayments of R10 000 at the end of each month thereafter. How long, in completed months, will it take Rajesh to repay the loan from the time the loan was granted? (5)

7.3.2 Calculate the value of the final payment. (4)

[15]

Stanmorephysics.com

QUESTION 8

8.1 Determine $f'(x)$ from first principles if it is given that $f(x) = -2x + 3$. (4)

8.2 Determine:

8.2.1 $g'(x)$ if $g(x) = -3x^4 + 2x$ (2)

8.2.2 $\frac{dy}{dx}$ if $y = \frac{2x^4 + 1}{x^2}$ (4)

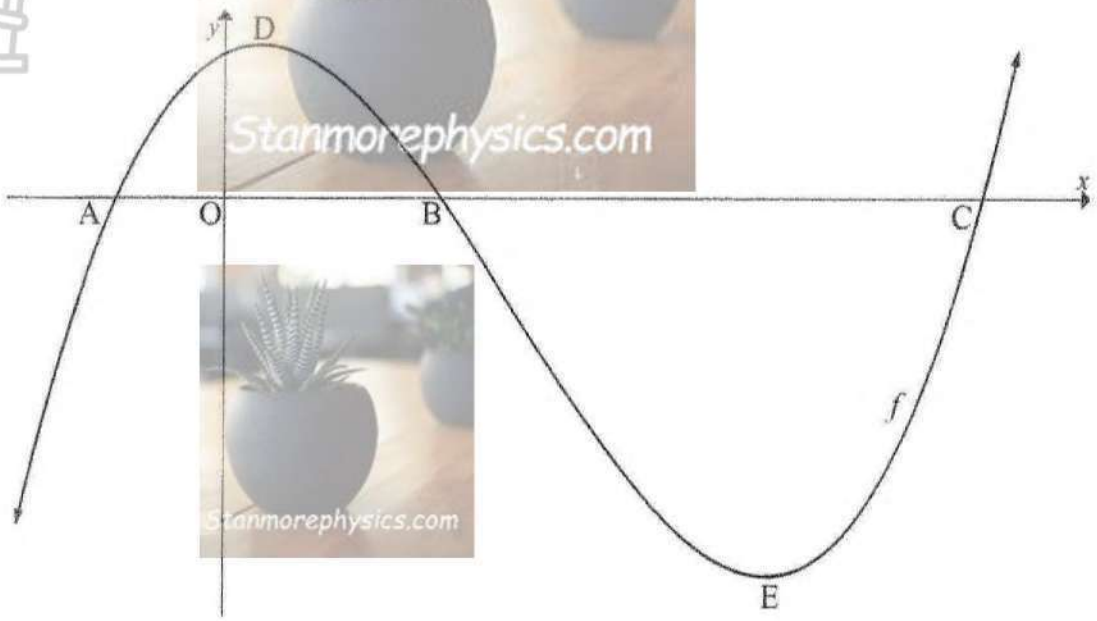
[10]

Stanmorephysics.com

Downloaded from Stanmorephysics.com
NSC Confidential

QUESTION 9

Sketched below is the graph of $f(x) = x^3 - 8x^2 + 5x + 14$. A, B and C are the x-intercepts of f. D and E are the turning points of f.



9.1 Calculate the coordinates of E. (4)

9.2 For which values of x is f concave down? (3)

9.3 The coordinates of B are $(2\,;0)$. Use the graph to determine the values of x for which $f(x) \cdot f''(x) < 0$ (4)

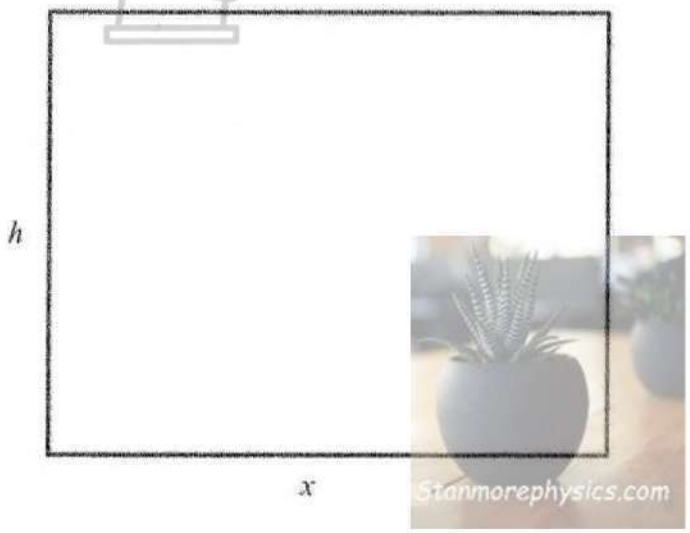
9.4 For which values of t will $y = -11x + t$ intersect f at 3 distinct points? (6)
[17]

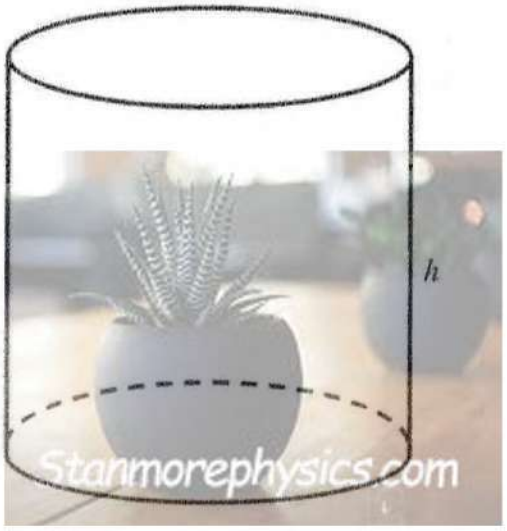
Copyright reserved

Downloaded from Stanmorephysics.com
NSC Confidential

QUESTION 10

A rectangular metal sheet has dimensions x and h units, with $x > h$, and a perimeter of 50 units. The metal sheet is rolled into a cylinder with two open ends (top and bottom) and height h units.





10.1 Show that the volume of the cylinder is given by $V = \frac{25x^2}{4\pi} - \frac{x^3}{4\pi}$ (3)

10.2 Calculate the value of x that will maximise the volume of the cylinder. (3)

[6]

Downloaded from Stanmorephysics.com

QUESTION 11

11.1 A survey was conducted among female and male learners at a school about which type of cold drink they preferred. The data from the survey is presented in the table below.

	JUICE	ENERGY DRINKS	TOTAL
Female	*a*	*b*	*c*
Male	36	54	*f*
Total	*e*	*d*	210

Stanmorephysics.com

11.1.1 The events male and preferring juice are independent. Show that $e = 84$. (3)

11.1.2 Calculate the probability that a female learner, chosen at random from the group, will like energy drinks. (3)

Stanmorephysics.com

11.2 At a kiosk, 120 people buy either a cup of coffee or a bottle of water. The chance of rain on any given day is 75%. The chance of a person buying a cup of coffee on a rainy day is three times the chance of the person buying coffee on a non-rainy day.

The probability of a person buying coffee on any given day is $\frac{7}{12}$.

Calculate the number of cups of coffee that will be sold on a non-rainy day. (4)

11.3 Eight runners compete in a race where there are no tied finishes. Bongi and Andrew are two of the competitors.

11.3.1 Calculate the total number of possible ways in which the 8 runners can finish the race if Bongi finishes in a position immediately after Andrew. (2)

11.3.2 Calculate the probability that TWO OR MORE runners finish the race after Andrew and before Bongi. (4)

[16]

TOTAL: 150

Copyright reserved

Downloaded from Stanmorephysics.com
NSC Confidential

INFORMATION SHEET

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

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

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

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

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

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

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

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

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

In ΔABC: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

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

$\sin(\alpha + \beta) = \sin\alpha.\cos\beta + \cos\alpha.\sin\beta$ $\quad \sin(\alpha - \beta) = \sin\alpha.\cos\beta - \cos\alpha.\sin\beta$

$\cos(\alpha + \beta) = \cos\alpha.\cos\beta - \sin\alpha.\sin\beta$ $\quad \cos(\alpha - \beta) = \cos\alpha.\cos\beta + \sin\alpha.\sin\beta$

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

$\sin 2\alpha = 2\sin\alpha.\cos\alpha$

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

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

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

Copyright reserved

Downloaded from Stanmorephysics.com

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Candidate Barcode Label/Stafieskodeplakker

NSC Answer Book
NSS-antwoordeboek

National Senior Certificate/*Nasionale Senior Sertifikaat* (Grade 12/*Graad 12*) – November 2025 ***Confidential/Vertroulik***

CENTRE NUMBER *SENTRUMNOMMER*	
EXAMINATION NUMBER *EKSAMENNOMMER*	
DATE *DATUM*	
SUBJECT CODE *VAKKODE*	
SUBJECT NAME *VAKNAAM*	**MATHEMATICS/*WISKUNDE***

Sequence No. on mark sheet
Volgnommer op punteblad

BOOK NUMBER *BOEKNOMMER*		**OF** *VAN*		**BOOKS** *BOEKE*
PAPER NUMBER *VRAESTELNOMMER*	**1**			

MARKER/*NASIENER*				MODERATOR'S INITIALS IN RELEVANT BLOCK / *MODERATOR SE VOORLETTERS IN RELEVANTE BLOKKIE*									
Question *Vraag*	**Marks** *Punte*	**Marker's Code & Initials** *Nasiener se kode & Voorletters*	**Marks** *Punte*	**SM** *SN*	**Marks** *Punte*	**DCM** *AHN*	**Marks** *Punte*	**CM** *HN*	**Marks** *Punte*	**IM**	**Marks** *Punte*	**EM**
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
		TOTAL *TOTAAL*										

CONTROLLED AND CERTIFIED CORRECT (SURNAME AND INITIALS OF EA) *GEKONTROLEER EN AS KORREK GESERTIFISEER (VAN EN VOORLETTERS VAN EA)*		**READ INSTRUCTIONS ON THE NEXT PAGE.** *LEES INSTRUKSIES OP DIE VOLGENDE BLADSY.*

This answer book consists of 23 pages./*Hierdie antwoordeboek bestaan uit 23 bladsye.*

Copyright reserved/*Kopiereg voorbehou*

Please turn over/*Blaai om asseblief*

Downloaded from Stanmorephysics.com

PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY	*VOLG ASSEBLIEF HIERDIE INSTRUKSIES NOUKEURIG*
1. Clearly write your examination number and centre number in the space provided and attach your barcode label in the space provided.	*1. Skryf jou eksamennommer en sentrumnommer duidelik in die ruimtes soos verskaf en plak jou stafieskodeplakker in die ruimte soos verskaf.*
2. Remember that your own name (or the name of your school) may not appear anywhere on or in this answer book.	*2. Onthou dat jou eie naam (of die naam van jou skool) nie op of in hierdie antwoordeboek mag voorkom nie.*
3. Answer ALL questions in the spaces provided.	*3. Beantwoord ALLE vrae in die ruimtes wat voorsien is.*
4. No pages may be torn from this answer book.	*4. Geen bladsye mag uit hierdie antwoordeboek geskeur word nie.*
5. Read the instructions printed on your timetable carefully as well as any other instructions which may be given in each examination paper.	*5. Lees die instruksies wat op jou eksamenrooster gedruk is, sorgvuldig deur, asook enige ander instruksies wat op elke eksamenvraestel gegee word.*
6. Candidates may not retain an answer book or remove it from the examination room.	*6. Geen antwoordeboek mag deur die kandidaat behou of uit die eksamenlokaal verwyder word nie.*
7. Answers must be written in black/blue ink as distinctly as possible. Do not write in the margins.	*7. Skryf die antwoorde so duidelik moontlik met swart/blou ink. Laat die kantlyne oop.*
8. Write the numbers of the questions you have answered on the front cover of the answer book where marks are to be recorded.	*8. Skryf die nommers van die vrae wat jy beantwoord het op die voorblad van die antwoordeboek waar die punte aangebring word.*
9. If you require additional space for your answers: 9.1 Use the additional space provided at the end of the answer book. 9.2 When answering a question in the additional space, indicate clearly the question number in the column on the LHS. 9.3 Rule off after each answer.	*9. In geval jy addisionele ruimte benodig vir jou antwoorde:* *9.1 Gebruik die addisionele ruimte wat aan die einde van die antwoordeboek voorsien word.* *9.2 As 'n vraag in die addisionele ruimte beantwoord word, dui duidelik die vraagnommer in die kolom aan die LK aan.* *9.3 Trek 'n lyn na elke antwoord.*
10. Draw a neat line through any work/rough work that must not be marked.	*10. Trek 'n netjiese lyn deur enige werk/rofwerk wat nie nagesien moet word nie.*

Stanmorephysics.com

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/VRAAG 1

	Solution/*Oplossing*	Marks *Punte*
1.1.1		(2)
1.1.2		(4)
1.1.3		(4)
1.1.4		(4)

Copyright reserved/*Koptereg voorbehou*

Downloaded from Stanmorephysics.com

	Solution/*Oplossing*	Marks *Punte*
1.1.5		(5)
1.2		(6)
		[25]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 2

	Solution/*Oplossing*	**Marks** ***Punte***
2.1.1		(3)
2.1.2		(3)
2.1.3		(2)

Stanmorephysics.com

Downloaded from Stanmorephysics.com

	Solution/*Oplossing*	**Marks** ***Punte***
2.2.1		(2)
2.2.2		(5)
		[15]

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

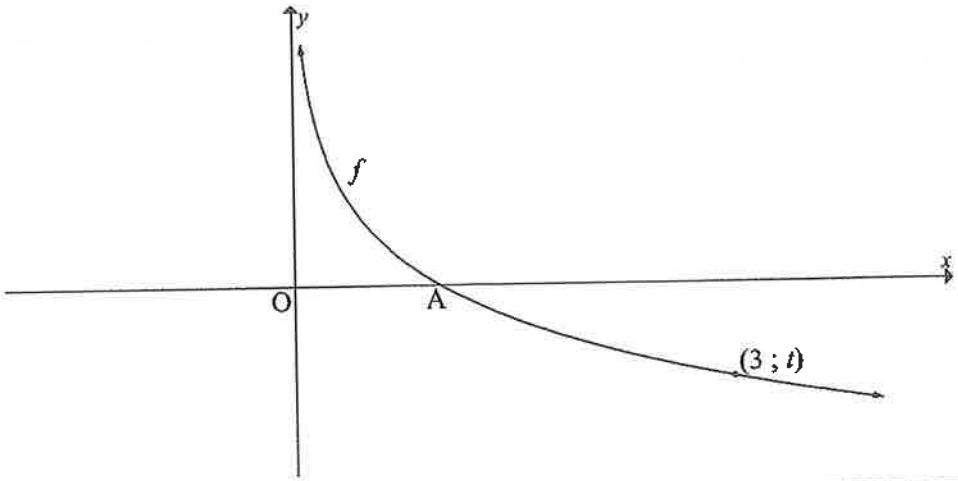
QUESTION/*VRAAG* 3

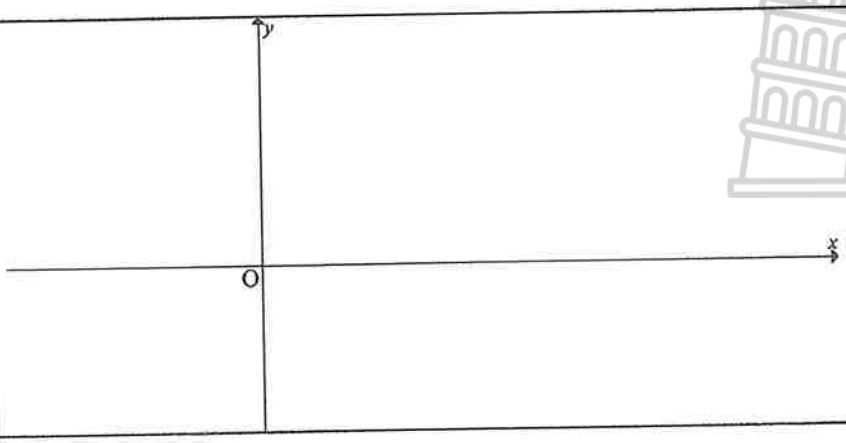
	Solution/*Oplossing*	**Marks** ***Punte***
3.1		(2)
3.2		(3)
3.3		(3)
3.4		(2)
		[10]

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 4

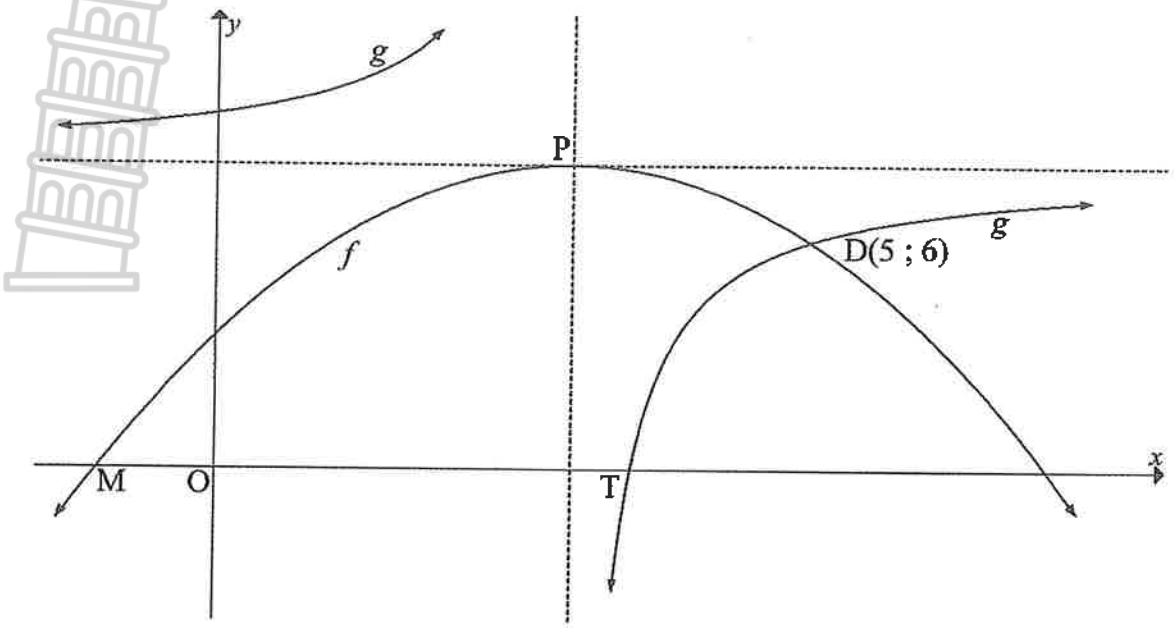


	Solution/*Oplossing*	Marks *Punte*
4.1		(1)
4.2		(1)
4.3		(2)
4.4		(1)
4.5		(3)
4.6		(2)
		[10]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 5



	Solution/*Oplossing*	**Marks** ***Punte***
5.1		(1)
5.2		(1)
5.3.1		(2)
5.3.2		(2)
5.4		(3)

Stanmorephysics.com

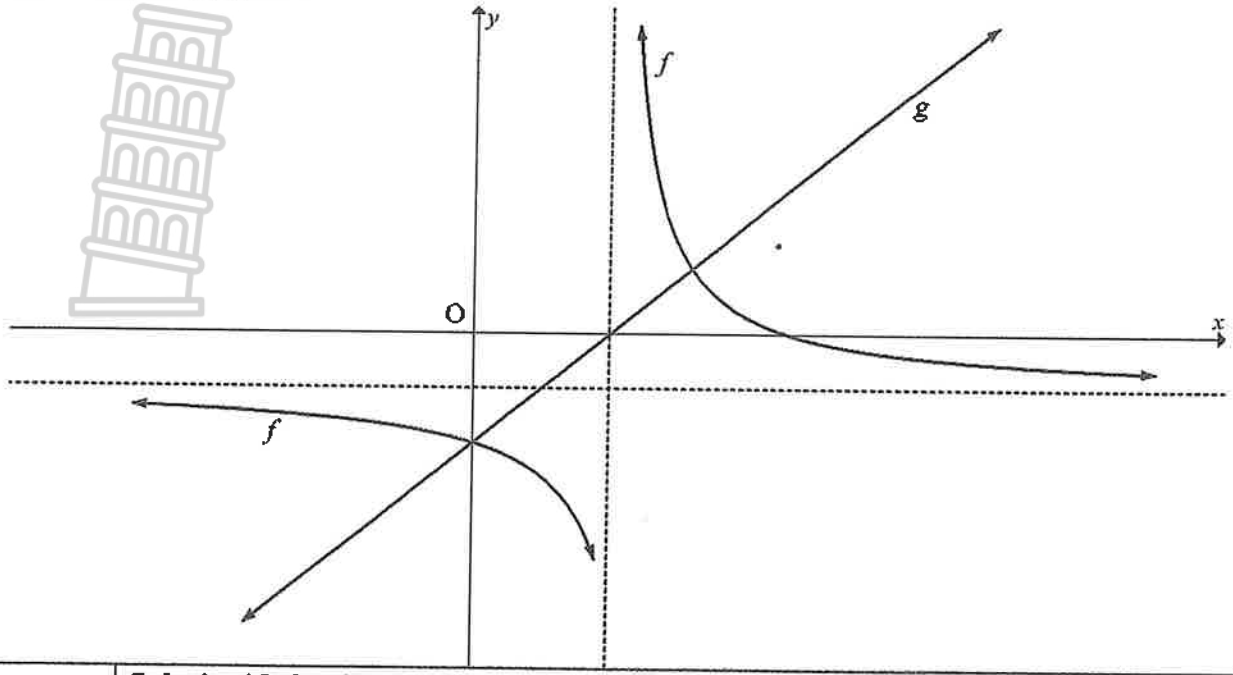
Downloaded from Stanmorephysics.com

5.5		(6)
5.6		(3)
		[18]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 6



	Solution/*Oplossing*	**Marks** ***Punte***
6.1		(1)
6.2		

Stanmorephysics.com

Downloaded from Stanmorephysics.com

6.2 (cont.)		(5)
6.3		(2)
		[8]

Downloaded from Stanmorephysics.com

QUESTION/VRAAG 7

	Solution/*Oplossing*	**Marks** ***Punte***
7.1		(2)
7.2		(4)
7.3.1		(5)

Stanmorephysics.com

Downloaded from Stanmorephysics.com

	Solution/*Oplossing*	Marks *Punte*
7.3.2		(4)
		[15]

Downloaded from Stanmorephysics.com

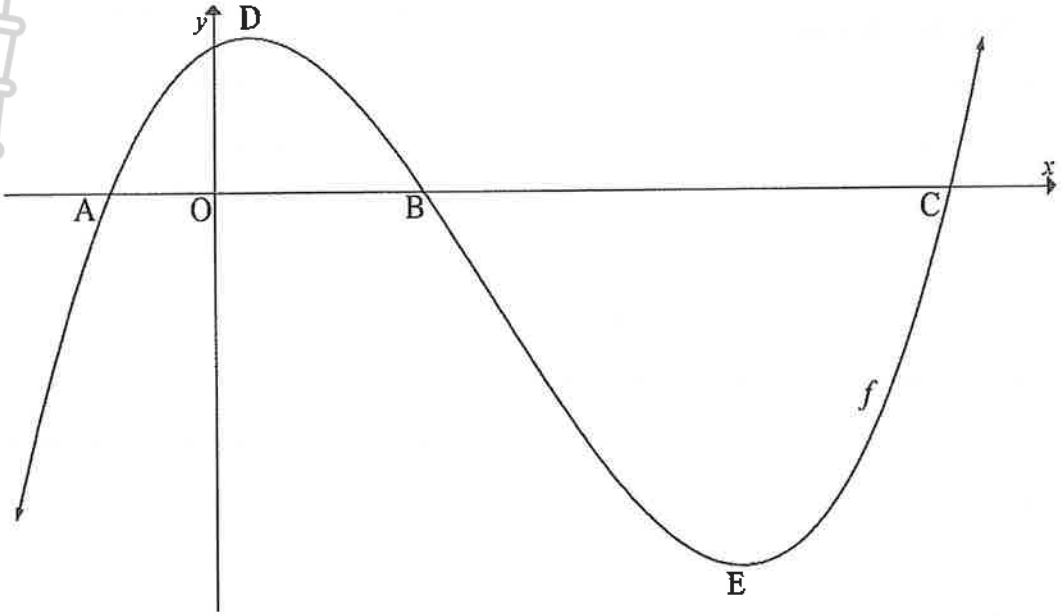
QUESTION/*VRAAG* 8

	Solution/*Oplossing*	**Marks** ***Punte***
8.1		(4)
8.2.1		(2)
8.2.2		(4)
		[10]

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 9



	Solution/*Oplossing*	**Marks** ***Punte***
9.1		(4)
9.2		(3)

Stanmorephysics.com

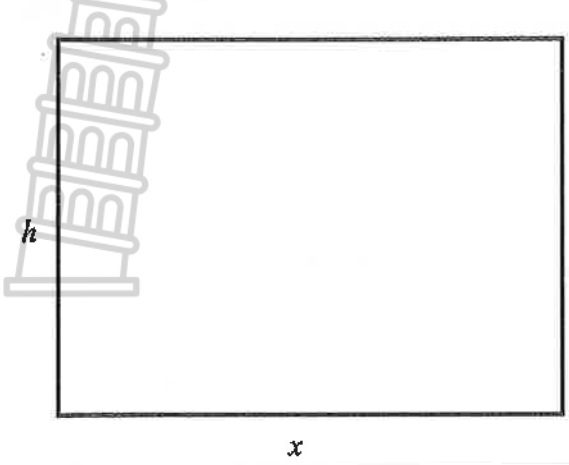
Downloaded from Stanmorephysics.com

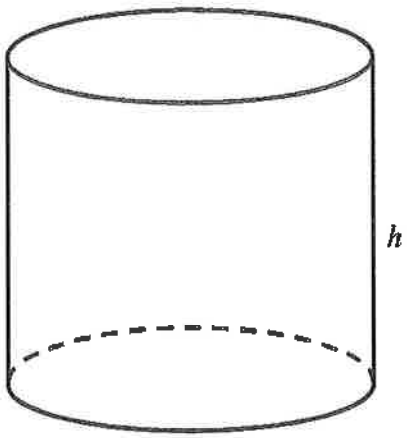
	Solution/*Oplossing*	**Marks** ***Punte***
9.3		(4)
9.4		(6)
		[17]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 10





	Solution/*Oplossing*	Marks *Punte*
10.1		(3)
10.2		(3)
		[6]

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 11

	Solution/*Oplossing*	**Marks** ***Punte***
11.1		

	JUICE/ *SAP*	**ENERGY DRINKS/ *ENERGIEDRANKIES***	**TOTAL/ *TOTAAL***
Female/ *Vroulik*	***a***	***b***	***c***
Male/ *Manlik*	36	54	***f***
Total/ *Totaal*	***e***	***d***	210

11.1.1		(3)
11.1.2		(3)

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

	Solution/*Oplossing*	Marks *Punte*
11.2		(4)

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

	Solution/*Oplossing*	Marks *Punte*
11.3.1		(2)
11.3.2		(4)
		[16]

Stanmorephysics.com

Downloaded from Stanmorephysics.com

	Additional space/*Bykomende ruimte*	**Marks** ***Punte***

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

	Additional space/*Bykomende ruimte*	Marks *Punte*

TOTAL/*TOTAAL*: 150

Copyright reserved/*Kopiereg voorbehou*

PRI-R3 Oct 21 2025 17:33:53

Downloaded from Stanmorephysics.com

RE-MARK/RE-CHECK *HERMERK/HERSIEN*				
Question *Vraag*	Marks *Punte*			Initials *Voorletters*
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
TOTAL *TOTAAL*				
HASH TOTAL *KAF-TOTAAL*				

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE 12/*GRAAD 12*

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2025

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Approved by Prof Rajendran Govender Umalusi Moderator 8/11/2025

These marking guidelines consist of 21 pages.
Hierdie nasienriglyne bestaan uit 21 bladsye.

Approved 2025-11-08

Approved Govender 8/11/2025

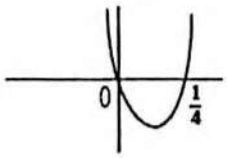
Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

NOTE:
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Consistent Accuracy applies in all aspects of the marking guidelines.

LET WEL:
- *Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.*
- *Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toepassing.*

QUESTION 1/*VRAAG* 1

1.1.1	$(x+5)(x-2)=0$ $x=-5$ or $x=2$	✓ $x=-5$ ✓ $x=2$ (2)
1.1.2	$5x^2+2=-9x$ $5x^2+9x+2=0$ $x=\frac{-9\pm\sqrt{(9^2)-4(5)(2)}}{2(5)}$ $x=\frac{-9\pm\sqrt{41}}{10}$ $x=-0,26$ or $x=-1,54$	✓ standard form ✓ substitution into the correct formula ✓ answer ✓ answer (4)
1.1.3	$8x^2>2x$ $8x^2-2x>0$ $2x(4x-1)>0$ CV: 0 ; $\frac{1}{4}$  $x<0$ or $x>\frac{1}{4}$	✓ standard form ✓ critical values/factors ✓✓ answer (4)
1.1.4	$2.2^{2x}-9.2^x+4=0$ $(2.2^x-1)(2^x-4)=0$ $2^x=\frac{1}{2}$ or $2^x=4$ $2^x=2^{-1}$ $2^x=2^2$ $x=-1$ $x=2$	✓ factors ✓ both equations ✓ answer ✓ answer (4)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Stanmorephysics.com

Downloaded from Stanmorephysics.com

	OR/*OF* $2.2^{2x}-9.2^{x}+4=0$ Let $k=2^{x}$ $2k^{2}-9k+4=0$ $(2k-1)(k-4)=0$ $k=\frac{1}{2}$ or $k=4$ $\therefore 2^{x}=\frac{1}{2}$ or $2^{x}=4$ $\therefore x=-1$ or $x=2$	**OR/*OF*** ✓factors ✓ both equations ✓ answer ✓ answer (4)
1.1.5	$\sqrt{\sqrt{\frac{1}{x}}+2}=\frac{1}{\sqrt{x}}$ $\left(\sqrt{\sqrt{\frac{1}{x}}+2}\right)^{2}=\left(\frac{1}{\sqrt{x}}\right)^{2}$ $\sqrt{\frac{1}{x}}+2=\frac{1}{x}$ $\frac{1}{\sqrt{x}}=\frac{1}{x}-2$ $\left(\frac{1}{\sqrt{x}}\right)^{2}=\left(\frac{1}{x}-2\right)^{2}$ $\frac{1}{x}=\frac{1}{x^{2}}-\frac{4}{x}+4$ $\frac{1}{x^{2}}-\frac{5}{x}+4=0$ $4x^{2}-5x+1=0$ $(4x-1)(x-1)=0$ $x=\frac{1}{4}$ or $x\neq 1$ **OR/*OF***	✓ squaring both sides ✓ isolation of surd ✓ squaring both sides only after isolation of surd ✓ standard form ✓ answer with selection (5) **OR/*OF***

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

1.1.5	$\sqrt{\sqrt{\frac{1}{x}+2}=\frac{1}{\sqrt{x}}}$ Let $\frac{1}{\sqrt{x}}=k$ $\sqrt{k+2}=k$ $k+2=k^2$ $k^2-k-2=0$ $(k-2)(k+1)=0$ $\therefore k=2$ or $k=-1$ $\frac{1}{\sqrt{x}}=2$ or $\frac{1}{\sqrt{x}}\neq -1$ $2\sqrt{x}=1$ $4x=1$ $\therefore x=\frac{1}{4}$	✓ equation ✓ squaring both sides ✓ standard form ✓ substitution ✓ answer with selection (5)
1.2	$x=y+2$ .....(1) $5xy=x^2+6$ .....(2) $5(y+2)y=(y+2)^2+6$ $5y^2+10y=y^2+4y+4+6$ $4y^2+6y-10=0$ $2y^2+3y-5=0$ $(2y+5)(y-1)=0$ $y=-\frac{5}{2}$ or $y=1$ $x=-\frac{1}{2}$ or $x=3$ **OR/*OF*** $y=x-2$ .....(1) $5xy-6=x^2$ .....(2) $5x(x-2)-6=x^2$ $5x^2-10x-6=x^2$ $4x^2-10x-6=0$ $2x^2-5x-3=0$ $(2x+1)(x-3)=0$ $x=-\frac{1}{2}$ or $x=3$ $y=-\frac{5}{2}$ or $y=1$	✓ $x=y+2$ ✓ $5xy=x^2+6$ ✓ substitution ✓ standard form ✓ y-values ✓ x-values (6) **OR/*OF*** ✓ $y=x-2$ ✓ $5xy-6=x^2$ ✓ substitution ✓ standard form ✓ x-values ✓ y-values (6) [25]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG 2*

2.1.1	$(10+t)+(t-2)+(t+4)$ $\frac{t-2}{t+10}=\frac{t+4}{t-2}$ $(t-2)^2=(t+4)(t+10)$ $t^2-4t+4=t^2+14t+40$ $-18t=36$ $\therefore t=-2$	✓ equating the ratios ✓ cross multiplication ✓ expansion (3)
2.1.2	$8;-4;\ldots$ $r=\frac{-4}{8}=-\frac{1}{2}$ $T_{25}=8\left(-\frac{1}{2}\right)^{24}$ $T_{25}=\left(\frac{1}{2}\right)^{21}$ or $T_{25}=(2)^{-21}$ or $T_{25}=(8)^{-7}$ or $T_{25}=(128)^{-3}$ or $T_{25}=(2\,097\,152)^{-1}$	✓ 8 and -4 ✓ r ✓ answer in exponential form (3)
2.1.3	$S_\infty=\frac{a}{1-r}$ $S_\infty=\frac{8}{1-\left(-\frac{1}{2}\right)}$ $S_\infty=\frac{16}{3}=5{,}33$	✓ substitution ✓ answer (2)
2.2.1	$T_{14}-T_6$ $=4\times 8$ $=32$ **OR/*OF*** $T_{14}-T_6$ $=(4(14)-1)-(4(6)-1)$ $=55-23$ $=32$ **OR/*OF*** $T_{14}-T_6$ $=(4(k+13)-1)-(4(k+5)-1)$ $=4k+51-(4k+19)$ $=32$	✓✓ answer (2) **OR/*OF*** ✓ subs ✓ answer (2) **OR/*OF*** ✓ subs ✓ answer (2)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Stanmorephysics.com

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

2.2.2	$n = 118 - k$	✓ number of terms
	$T_{117} = 467$	✓ last term
	$S_{118-k} = \frac{118-k}{2}[4k - 1 + 467]$	✓ substitution
	$26\,675 = (118-k)[2k + 233]$	
	$26\,675 = 236k + 27494 - 2k^2 - 233k$	✓standard form
	$2k^2 - 3k - 819 = 0$	
	$(k-21)(2k+39) = 0$	
	$\therefore k = 21$ or $k \neq -\frac{39}{2}$	✓answer with selection
		(5)
	OR/*OF*	**OR/*OF***
	$n = 118 - k$	✓ number of terms
	$S_{118-k} = \frac{118-k}{2}[2(4k-1) + (118-k-1)(4)]$	✓ substitution
	$26\,675 = \frac{118-k}{2}[8k - 2 + 468 - 4k]$	✓simplification
	$53\,350 = (118-k)[4k + 466]$	
	$53\,350 = 472k + 54\,988 - 4k^2 - 466k$	
	$4k^2 - 6k - 1638 = 0$	✓ standard form
	$2k^2 - 3k - 819 = 0$	
	$(k-21)(2k+39) = 0$	
	$\therefore k = 21$ or $k \neq -\frac{39}{2}$	✓answer with selection
		(5)
	OR/OF	
	$T_1 = 3 \quad T_2 = 7$	
	$S_{117} - S_{k-1} = 26\,675$	
	$S_{117} = \frac{n}{2}[2a + (n-1)d]$	
	$= \frac{117}{2}[2(3) + (116)4]$	
	$= 27\,495$	✓ 27 495
	$\therefore S_{k-1} = 27\,495 - 26\,675 = 820$	✓ difference
	$820 = \frac{n}{2}[2(3) + 4n - 4]$	✓substitution
	$0 = 2n^2 + n - 820$	✓ standard form
	$(2n+41)(n-20) = 0$	
	$\therefore n = 20$	
	$\therefore k - 1 = 20$	
	$k = 21$	✓answer with selection
		(5)
		[15]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 3

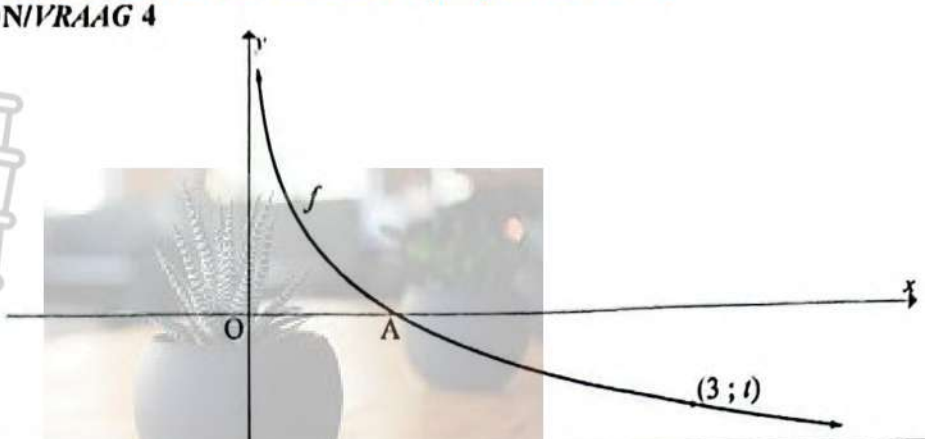
3.1	36 ; 71 ; 104 ; 135 ; 164 35 33 31 29 -2 $T_5 = 164$	✓first differences ✓ answer (2)
3.2	$2a = -2$ $a = -1$ $3(-1)+b = 35$ $b = 38$ $-1+38+c = 36$ $c = -1$ $T_n = -n^2+38n-1$	✓ $2a = -2$ ✓ $3(-1)+b = 35$ ✓ $-1+38+c = 36$ (3)
3.3	$n = \frac{-38}{2(-1)} = 19$ $T_{19} = -(19)^2+38(19)-1 = 360$ **OR/*OF*** $T'_n = -2n+38 = 0$ $\therefore n = 19$ $T_{19} = -(19)^2+38(19)-1 = 360$	✓ method ✓ n ✓ answer (3) **OR/*OF*** ✓ method ✓ n ✓ answer (3)
3.4	$\frac{n+3}{2} = 19$ $n+3 = 38$ $n = 35$ **OR/*OF*** $-n^2+38n-1 = 104$ $n^2-38n+105 = 0$ $(n-35)(n-3) = 0$ $n = 35$	✓ method ✓ answer (2) ✓ method ✓ answer (2)
		[10]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

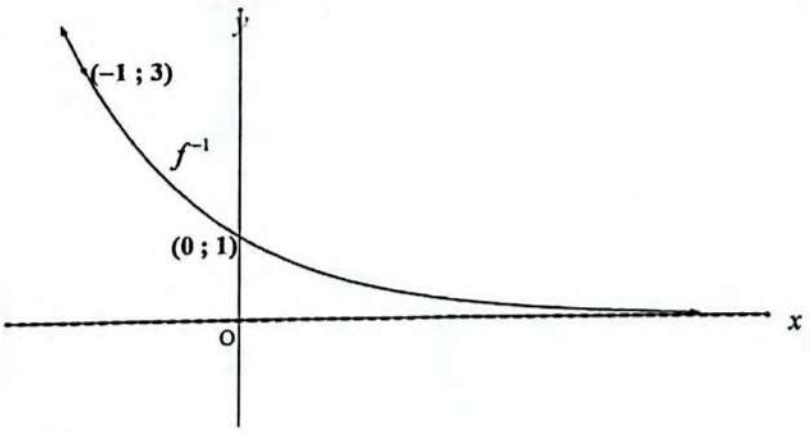
QUESTION/*VRAAG* 4



4.1	$t = \log_{\frac{1}{3}} 3$ $t = -1$	✓ answer (1)
4.2	$A(1;0)$	✓ answer (1)
4.3	$f(x) = \log_{\frac{1}{3}} x$ $y = \log_{\frac{1}{3}} x$ $x = \log_{\frac{1}{3}} y$ $y = \left(\frac{1}{3}\right)^x = 3^{-x}$	✓ swopping ✓ answer (2)
4.4	$y = 0$	✓ answer (1)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

4.5



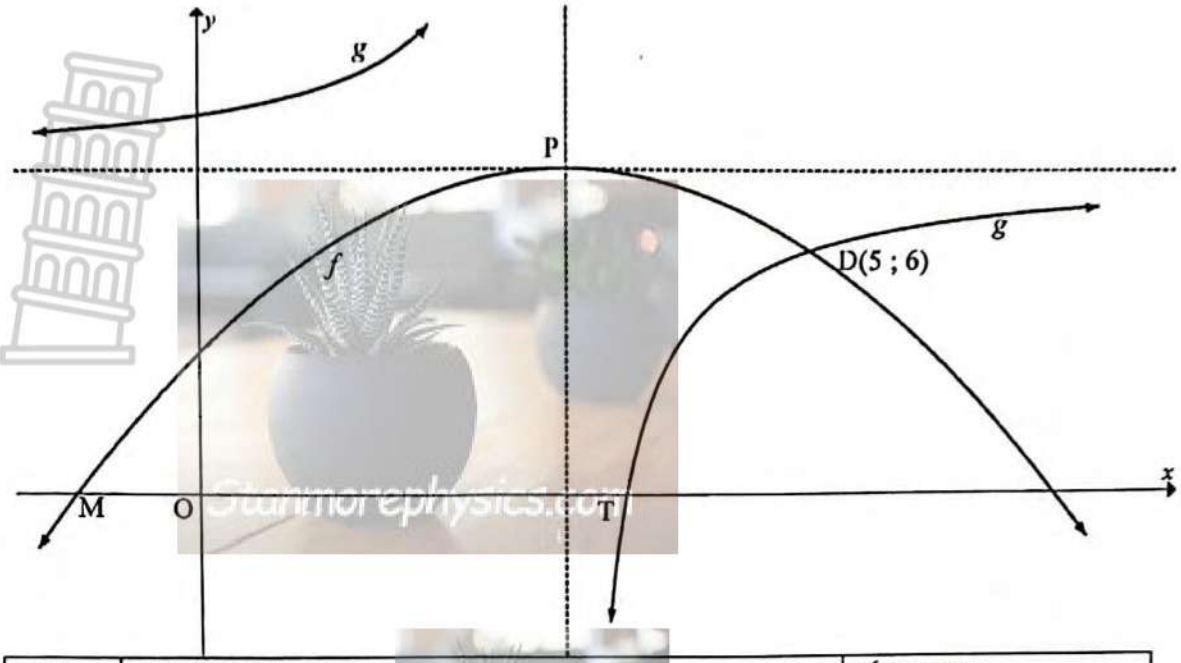
✓ decreasing exponential shape with asymptote $y = 0$
✓ y-intercept $(0 ; 1)$
✓ any point

4.6	(4 ; 3) is a point on h $0 < y < 3$ or $y \in (0 ; 3)$	✓✓ answer (2)
		[10]

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 5



5.1	$x \in R,\ x \neq 3$	✓ answer (1)
5.2	$y \leq 8$	✓ answer (1)
5.3.1	$3 < x \leq 5$ **OR/*OF*** $x \in (3;5]$	✓✓ answer (2)
5.3.2	$x < 1$ or $x > 5$ **OR/*OF*** $x \in (-\infty;1)$ or $x \in (5;\infty)$	✓ $x < 1$ ✓ $x > 5$ (2)
5.4	$y = a(x-3)^2 + 8$ $6 = a(5-3)^2 + 8$ $-2 = 4a$ $\therefore a = -\frac{1}{2}$ $y = -\frac{1}{2}(x-3)^2 + 8$ $y = -\frac{1}{2}(x^2 - 6x + 9) + 8$ $y = -\frac{1}{2}x^2 + 3x + \frac{7}{2}$	✓ p and q values ✓ substitution (5 ; 6) ✓ simplification (3)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*

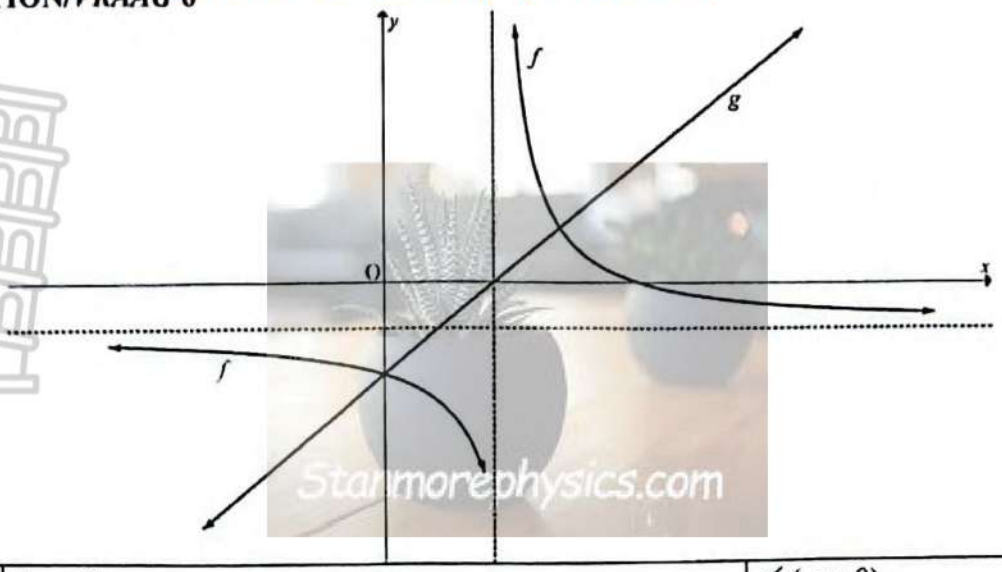
Downloaded from Stanmorephysics.com

5.5	$y=-\frac{1}{2}x^2+3x+\frac{7}{2}$ $x^2-6x-7=0$ $(x-7)(x+1)=0$ $x=7 \quad \text{or} \quad x=-1$ M$(-1\,;0)$ $0=\frac{-4}{x-3}+8$ $-8x+24=-4$ $x=\frac{7}{2}$ $\text{T}\left(\frac{7}{2};0\right)$ $\text{MT}=\frac{7}{2}+1=\frac{9}{2}=4,5$	✓ solve for x ✓ x-values ✓ coordinates of M ✓ solve for x ✓ x-value ✓ MT (6)
5.6	$f(x)=-\frac{1}{2}x^2+3x+\frac{7}{2}$ $f'(x)=-x+3$ $m=f'(5)$ $=-5+3$ $=-2$ $6=-2(5)+c$ $c=16$ $\therefore y=-2x+16$	✓ $f'(x)=-x+3$ ✓ $m=f'(5)$ ✓ answer (3)
		[18]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG 6*



6.1	$(-p\ ;\ 0)$	✓ $(-p\ ;\ 0)$ (1)
6.2	$g(x)=x+c$ $q=1+c$ $f(x)=\frac{a}{x+c}+1+c$ Point $(0\ ;\ c)$ $c=\frac{a}{0+c}+1+c$ $-1=\frac{a}{c}$ $a=-c$ Point $(3\ ;\ 3+c)$ $3+c=\frac{a}{3+c}+1+c$ $3+c=\frac{-c}{3+c}+1+c$ $9+6c+c^2=-c+3+4c+c^2$ $3c=-6$ $c=-2$ $a=2$ $q=-1$ $f(x)=\frac{2}{x-2}-1$ **OR/*OF***	✓ $q=1+c$ ✓ $f(x)=\frac{a}{x+c}+1+c$ ✓ $3+c=\frac{a}{3+c}+1+c$ ✓ $a=2$ ✓ $q=-1$ (5) **OR/*OF***

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

	$0=x+c$ $\therefore\ x=-c$	
	$q=1+c$	✓ $q=1+c$
	$f(x)=\frac{a}{x+c}+1+c$	✓ $f(x)=\frac{a}{x+c}+1+c$
	$3+c=\frac{a}{3+c}+1+c$	✓ $3+c=\frac{a}{3+c}+1+c$
	$2=\frac{a}{3+c}$ $a=6+2c$	
	$y=\frac{6+2c}{x+c}+1+c$ $c=\frac{6+2c}{0+c}+1+c$ $-1=\frac{6+2c}{c}$ $-c=6+2c$ $\therefore\ c=-2$ $a=2$ $q=-1$ $\therefore\ f(x)=\frac{2}{x-2}-1$	✓ $a=2$ ✓ $q=-1$ (5)
6.3	Translation of 1 unit down **OR/*OF*** Translation of 1 unit to the right	✓✓ answer (2) **OR/*OF*** ✓✓ answer (2)
		[8]

Stanmorephysics.com

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG 7*

7.1	$A = P(1+i)^n$ $A = 40\,000(1+7{,}8\%)^5$ $A = R58\,230{,}94$	✓ substitution into correct formula ✓ answer (2)
7.2	$F = \dfrac{x\left[(1+i)^n - 1\right]}{i}$ $F = \dfrac{2\,300\left[\left(1+\dfrac{0{,}058}{4}\right)^{24} - 1\right]}{\dfrac{0{,}058}{4}} \times \left(1+\dfrac{0{,}058}{4}\right)$ $F = R66\ 411{,}60$ **OR/*OF*** $F = \dfrac{2\,300\left[\left(1+\dfrac{0{,}058}{4}\right)^{25} - 1\right]}{\dfrac{0{,}058}{4}} - 2300$ $F = R66\,411{,}60$	✓ i ✓ substitution into correct formula ✓ future value $\times (1+i)^1$ ✓ answer (4) **OR/*OF*** ✓ i ✓ substitution into correct formula ✓ -2300 ✓ answer (4)
7.3.1	$A = P(1+i)^n$ $A = 900\,000\left(1+\dfrac{0{,}068}{12}\right)^3$ $= R915\,386{,}86$ $P = \dfrac{x\left[1-(1+i)^{-n}\right]}{i}$ $915\,386{,}86 = \dfrac{10\,000\left[1-\left(1+\dfrac{0{,}068}{12}\right)^{-n}\right]}{\dfrac{0{,}068}{12}}$ $\left(1+\dfrac{0{,}068}{12}\right)^{-n} = 0{,}4812...$ $-n = \log_{1{,}005...} 0{,}4812...$ $n = 129{,}419...$ months $\therefore 132{,}419$ months since loan was granted $\therefore 133$ months since loan was granted	✓ answer ✓ substitution into correct formula ✓ correct use of logs ✓ answer of n ✓ final answer (5)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

7.3.2	$P = \dfrac{10\,000\left[1-\left(1+\dfrac{0,068}{12}\right)^{-0,419\ldots}\right]}{\dfrac{0,068}{12}}$	✓ substitution ✓ n
	$= \text{R}4\,173,55\ldots$	✓ balance
	Final payment $= 4173,55\ldots\left(1+\dfrac{0,068}{12}\right)^{1} = R4\,197,21$	✓ final payment (4)
	OR/*OF*	**OR/*OF***
	$A = 915\,386,86\left(1+\dfrac{0,068}{12}\right)^{129}$ $= \text{R}1\,897\,482,712$	✓answer
	$F = \dfrac{10\,000\left[\left(1+\dfrac{0,068}{12}\right)^{129}-1\right]}{\dfrac{0,068}{12}}$ $= \text{R}1\,893\,309,16$	✓ answer
	Balance after 129 months = R4 173,552	✓balance
	Final payment $= 4\,173,552\left(1+\dfrac{0,068}{12}\right)^{1} = \text{R}4\,197,21$	✓final payment (4)
		[15]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

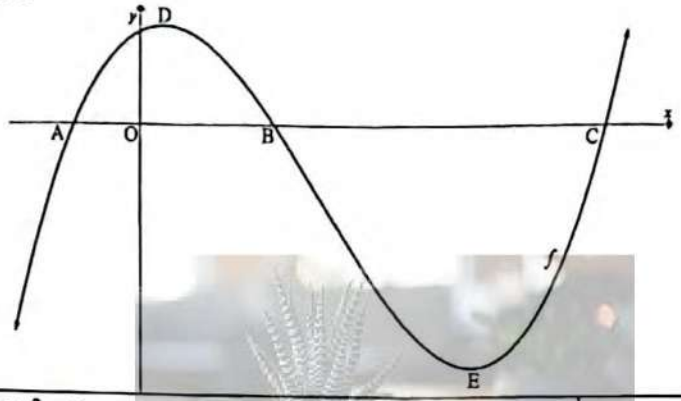
QUESTION/*VRAAG* 8

8.1	$f(x)=-2x+3$ $f'(x)=\lim\limits_{h\to 0}\dfrac{f(x+h)-f(x)}{h}$ $=\lim\limits_{h\to 0}\dfrac{-2(x+h)+3-(-2x+3)}{h}$ $=\lim\limits_{h\to 0}\dfrac{-2h}{h}$ $=\lim\limits_{h\to 0}(-2)$ $=-2$ **OR/*OF*** $f(x)=-2x+3$ $f(x+h)=-2(x+h)+3$ $f(x+h)-f(x)=-2x-2h+3+2x-3=-2h$ $f'(x)=\lim\limits_{h\to 0}\dfrac{f(x+h)-f(x)}{h}$ $=\lim\limits_{h\to 0}\dfrac{-2h}{h}$ $=\lim\limits_{h\to 0}(-2)$ $=-2$	✓ $f(x+h)$ ✓substitution ✓simplification ✓answer (4) **OR/*OF*** ✓ $f(x+h)$ ✓simplification ✓substitution ✓answer (4)
8.2.1	$g(x)=-3x^4+2x$ $g'(x)=-12x^3+2$	✓ $-12x^3$ ✓ 2 (2)
8.2.2	$y=\dfrac{2x^4+1}{x^2}$ $y=2x^2+x^{-2}$ $\dfrac{dy}{dx}=4x-2x^{-3}$	✓ $2x^2$ ✓ x^{-2} ✓ derivative first term ✓ derivative second term (4)
		[10]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG 9*



DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

9.1	$f(x)=x^3-8x^2+5x+14$ $f'(x)=3x^2-16x+5=0$ $(3x-1)(x-5)=0$ $x=\frac{1}{3}$ or $x=5$ E$(5\ ;\ -36)$	✓ $f'(x)$ ✓ $f'(x)=0$ ✓ x-value ✓ y-value (4)
9.2	$f''(x)=6x-16<0$ $x<\frac{8}{3}$ **OR/*OF*** $x=\frac{\frac{1}{3}+5}{2}=\frac{8}{3}$ $x<\frac{8}{3}$	✓ $f''(x)$ ✓ $f''(x)<0$ ✓ answer (3) **OR/*OF*** ✓ midpoint of TPs ✓ $f''(x)<0$ ✓ answer (3)
9.3	x-intercepts of f: $(-1\ ;\ 0)$ and $(7\ ;\ 0)$ $-1<x<2$ or $\frac{8}{3}<x<7$	✓✓ x-intercepts ✓ first interval ✓ second interval (4)
9.4	$3x^2-16x+5=-11$ $3x^2-16x+16=0$ $(x-4)(3x-4)=0$ $x=4$ or $x=\frac{4}{3}$ At $x=4$: $(4)^3-8(4)^2+5(4)+14=-11(4)+t$ $t=14$ At $x=\frac{4}{3}$: $\left(\frac{4}{3}\right)^3-8\left(\frac{4}{3}\right)^2+5\left(\frac{4}{3}\right)+14=-11\left(\frac{4}{3}\right)+t$ $t=\frac{634}{27}=23\frac{13}{27}=23,48$ $\therefore 14<t<\frac{634}{27}$	✓ equating ✓ x-values ✓ answer ✓ answer ✓✓ answer (6)

Downloaded from Stanmorephysics.com

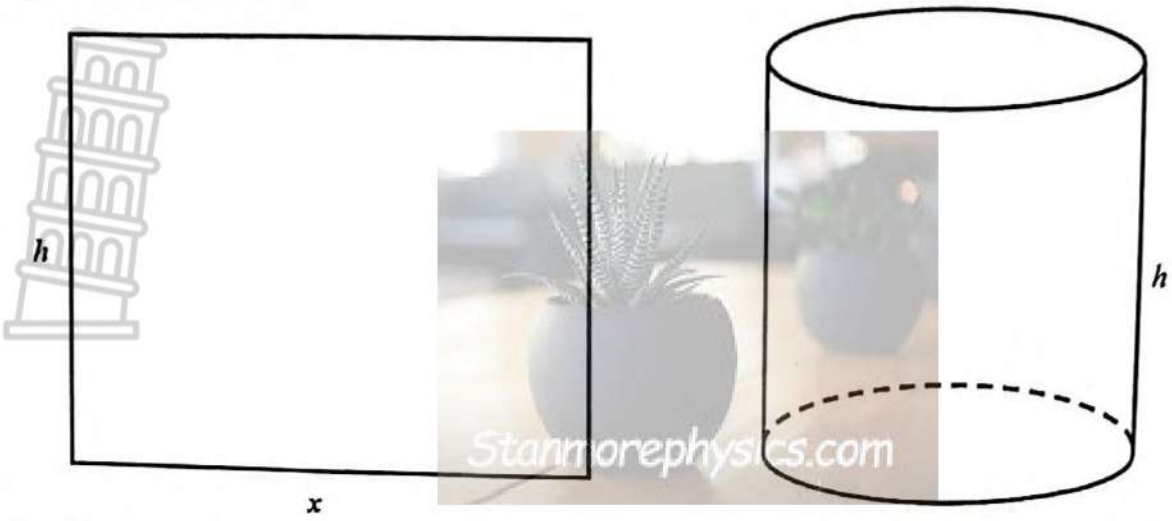
	OR/*OF*	**OR/*OF***
	$x^3-8x^2+5x+14=-11x+t$	✓ equating
	$x^3-8x^2+5x+14+11x=t$	
	$x^3-8x^2+16x+14=t$	
	$3x^2-16x+16=0$	
	$(x-4)(3x-4)=0$	
	$x=4 \quad \text{or} \quad x=\frac{4}{3}$	✓ x-values
	At $x=4$: $(4)^3-8(4)^2+5(4)+14=-11(4)+t$	✓ answer
	$t=14$	
	At $x=\frac{4}{3}$: $\left(\frac{4}{3}\right)^3-8\left(\frac{4}{3}\right)^2+5\left(\frac{4}{3}\right)+14=-11\left(\frac{4}{3}\right)+t$	
	$t=\frac{634}{27}=23\frac{13}{27}=23,48$	✓ answer
	$\therefore 14<t<\frac{634}{27}$	✓✓ answer (6)
		[17]

Stanmorephysics.com

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 10



10.1	$2x+2h=50$ $h=25-x$ $2\pi r=x$ $r=\frac{x}{2\pi}$ $V=\pi r^2 h$ $V=\pi\left(\frac{x}{2\pi}\right)^2(25-x)$ $V=\frac{\pi x^2}{4\pi^2}(25-x)$ $V=\frac{25x^2}{4\pi}-\frac{x^3}{4\pi}$	✓ $2x+2h=50$ ✓ $r=\frac{x}{2\pi}$ ✓ substitution (3)
10.2	$V'(x)=\frac{50x}{4\pi}-\frac{3x^2}{4\pi}$ $V'(x)=\frac{50x}{4\pi}-\frac{3x^2}{4\pi}=0$ $50x-3x^2=0$ $0=x(50-3x)$ $x\neq 0$ or $x=\frac{50}{3}$ $\therefore x=\frac{50}{3}=16,67$	✓ $\frac{50x}{4\pi}-\frac{3x^2}{4\pi}$ ✓ $V'(x)=0$ ✓ answer with selection (3)
		[6]

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 11

	JUICE	ENERGY DRINKS	TOTAL
Females	a	**72**	**120**
Males	36	54	**90**
Total	**84**	**126**	210

11.1.1	$P(\text{Male and Prefer juice}) = P(\text{Male}) \times P(\text{Prefer juice})$ $\frac{36}{210} = \frac{90}{210} \times \frac{e}{210}$ $e = 84$	✓ $P(\text{M and J}) = P(\text{M}) \times P(\text{J})$ ✓ $\frac{36}{210}$ ✓ $P(\text{Male}) = \frac{90}{210}$ (3)
11.1.2	$P(\text{Female and like energy drink}) = \frac{b}{210}$ $d = 210 - 84 = 126$ $b = 126 - 54 = 72$ $P(\text{Female and like energy drink}) = \frac{72}{210} = \frac{12}{35} = 0,34$ **OR/*OF*** $c = 120$ $b = 72$ $P(\text{Female and like energy drink}) = \frac{72}{210} = \frac{12}{35} = 0,34$	✓ d- value ✓ b-value ✓ answer (3) **OR/*OF*** ✓ c- value ✓ b-value ✓ answer (3)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*

Downloaded from Stanmorephysics.com

11.2

$\frac{3}{4}(3x)+\frac{1}{4}x=\frac{7}{12}$

$27x+3x=7$

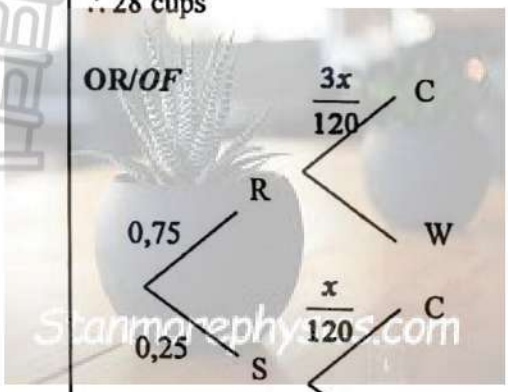
$30x=7$

$x=\frac{7}{30}$

$\therefore$ 28 cups

✓ $\frac{3}{4}(3x)$
✓ $\frac{1}{4}x$
✓ $=\frac{7}{12}$
✓answer (4)

OR/*OF*



OR/*OF*

$\frac{75}{100}\times\left(\frac{3x}{120}\right)+\frac{25}{100}\left(\frac{x}{120}\right)=\frac{7}{12}$

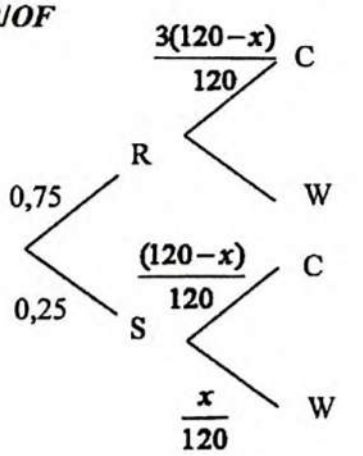
$\frac{3}{160}x+\frac{1}{480}x=\frac{7}{12}$

$10x=280$

$x=28$ cups of coffee

✓ $\frac{75}{100}\times\left(\frac{3x}{120}\right)$
✓ $\frac{25}{100}\left(\frac{x}{120}\right)$
✓ $=\frac{7}{12}$
✓answer (4)

OR/*OF*



$\frac{75}{100}\times\left(\frac{3(120-x)}{120}\right)+\frac{25}{100}\left(\frac{120-x}{120}\right)=\frac{7}{12}$

$270-\frac{9}{4}x+30-\frac{1}{4}x=70$

$-\frac{5}{2}x=-230$

$\therefore x=92$ (bottles of water)

$\therefore$ there are 28 cups of coffee

✓ $\frac{75}{100}\times\left(\frac{3(120-x)}{120}\right)$
✓ $\frac{25}{100}\left(\frac{120-x}{120}\right)$
✓ $=\frac{7}{12}$
✓answer (4)

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Downloaded from Stanmorephysics.com

11.3.1	$7.6! = 5\,040$ **OR/*OF*** $7! = 5\,040$	✓✓ answer (2) **OR/*OF*** ✓✓ answer (2)
11.3.2	Possible outcomes: $A \times 6 \times 5 \times B \times 4 \times 3 \times 2 \times 1$ $A \times 6 \times 5 \times 4 \times B \times 3 \times 2 \times 1$ $A \times 6 \times 5 \times 4 \times 3 \times B \times 2 \times 1$ $A \times 6 \times 5 \times 4 \times 3 \times 2 \times B \times 1$ $A \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 \times B$ $5 \times 6! + 4 \times 6! + 3 \times 6! + 2 \times 6! + 1 \times 6!$ $= 6!(5+4+3+2+1)$ $= 6!(15)$ P(two or more runners finishing after Andrew) $= \frac{6!(15)}{8!}$ $= \frac{15}{56}$ $= 0,27$ **OR/*OF*** $\frac{8! - (7!.2 + 2.6.6!)}{8!.2}$ $= \frac{15}{56}$	✓✓ 6! (15) ✓ 8! in denominator ✓ $\frac{6!(15)}{8!}$ or $\frac{15}{56}$ (4) **OR/*OF*** ✓ 8! in numerator and denominator ✓✓ $(7!.2 + 2.6.6!)$ ✓ $\frac{15}{56}$ (4)
		[16]

TOTAL/*TOTAAL*: 150

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2025 -11- 11
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Copyright reserved/*Kopiereg voorbehou*