



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

MATHEMATICS P1

NOVEMBER 2018

MARKS: 100

TIME: 2 hours

¹ This question paper consists of 7 pages.



INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of EIGHT questions.
2. Answer ALL the questions.
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 answers off to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Write neatly and legibly.



QUESTION 1

1.1 Factorise the following expressions fully:

1.1.1 $4x - x^3$ (2)

1.1.2 $x^2 + 15x - 54$ (2)

1.1.3 $y - xy + x - 1$ (3)

1.2 Simplify the following expressions fully:

1.2.1 $(x + 2)(x^2 - x + 3)$ (2)

1.2.2 $\frac{5}{x+3} - \frac{3}{2-x}$ (3)

1.2.3 $\frac{25^{-x} \cdot 15^{x+1}}{3^x \cdot 5^{-x}}$ (3)

1.3 Determine the value of $(3p + q)^2$ if $9p^2 + q^2 = 12$ and $pq = -3$. (3)
[18]**QUESTION 2**2.1 Solve for x :

2.1.1 $px + qx = a$ (2)

2.1.2 $2x^2 - 5x + 2 = 0$ (3)

2.1.3 $\left(\frac{1}{2}\right)^{3x+1} = 32$ (3)

2.2 Given: $-11 \leq 3m - 8 < 4$ 2.2.1 Solve for m . (2)

2.2.2 Hence, write down the number of integers that satisfy the inequality. (1)

2.3 Solve simultaneously for x and y if:

$$5x + 4y = 21 \text{ and } 2x = 3 - y$$
 (4)
[15]



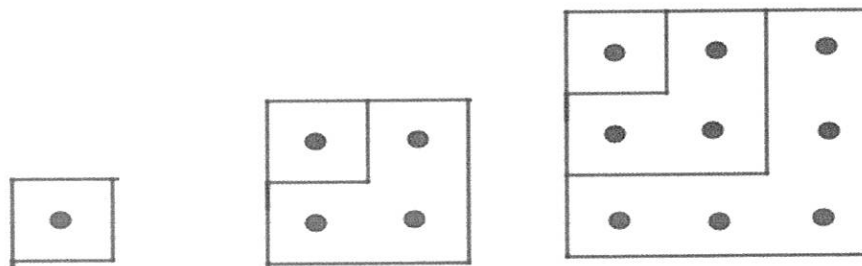
QUESTION 3

Consider the finite linear pattern: 20 ; 17 ; 14 ; ... ; -103

- 3.1 Write down the 4th term of the pattern. (1)
 - 3.2 Determine the expression for the n^{th} term. (2)
 - 3.3 Calculate the number of terms in the sequence. (2)
 - 3.4 Which term is the first to have a negative value? (3)
 - 3.5 What is the value of the 19th even-valued term in the sequence? (2)
- [10]**

QUESTION 4

Samantha is investigating a pattern of dots represented in the diagram below.



Pattern number:	1	2	3
Number of dots:	$1^2 = 1$	$1 + 3 = 2^2 = 4$	$1 + 3 + 5 = 3^2 = 9$

- 4.1 Write down:
 - 4.1.1 The number of dots in the 4th pattern (1)
 - 4.1.2 The number of dots in the 13th pattern (1)
 - 4.1.3 A formula for the number of dots in the n^{th} pattern (1)
- 4.2 Hence, or otherwise, calculate the value of:

$1 + 3 + 5 + \dots + 43$

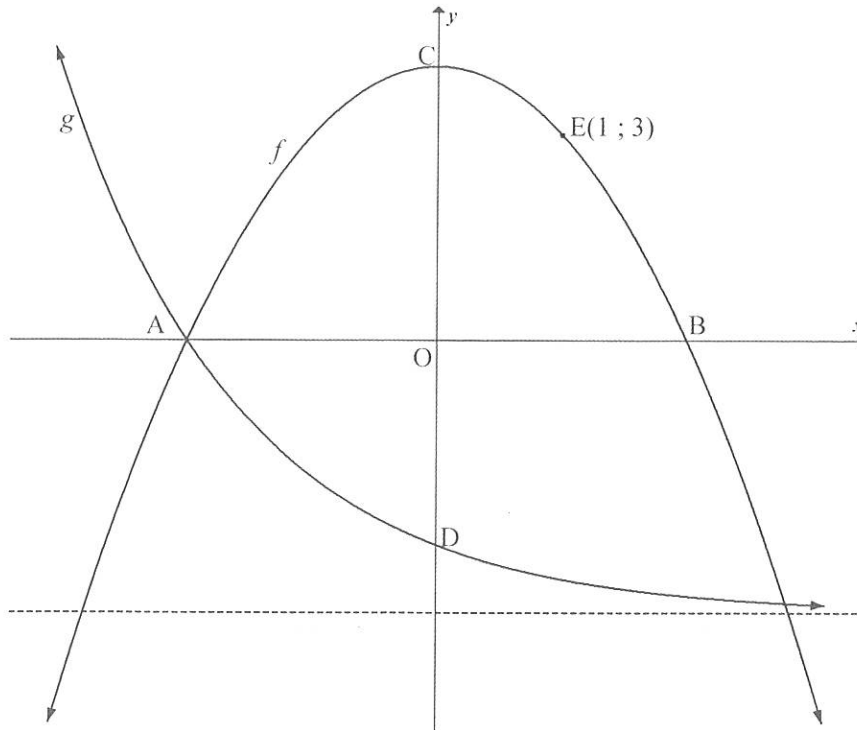
[6]



QUESTION 5

Sketched below are the graphs of $f(x) = ax^2 + q$ and $g(x) = \left(\frac{1}{2}\right)^x - 4$.

A and B are the x -intercepts of f . The graphs intersect at A and point E(1 ; 3) lies on f .
C is the turning point of f and D is the y -intercept of g .



- 5.1 Write down the:
- 5.1.1 Coordinates of D (2)
- 5.1.2 Range of g (1)
- 5.2 Calculate the:
- 5.2.1 Coordinates of A (2)
- 5.2.2 Values of a and q (4)
- 5.3 Determine the:
- 5.3.1 Length of CD (2)
- 5.3.2 Equation of a straight line through A and D (3)
- 5.4 For which values of x is:
- 5.4.1 $f(x) > 0$? (2)
- 5.4.2 f decreasing? (1)

[17]

QUESTION 6

The equation of the function $g(x) = \frac{a}{x} + q$ passes through the point $(3; 2)$ and has a range of $y \in (-\infty; 1) \cup (1; \infty)$.

- 6.1 Determine the:
- 6.1.1 Equation of g (3)
- 6.1.2 Equation of h , the axis of symmetry of g which has a positive gradient (2)
- 6.2 Sketch the graphs of g and h on the same system of axes. Clearly show ALL the asymptotes and intercepts with axes. (4)
- 6.3 Write the equations of the asymptotes of f if $f(x) = -g(x) + 5$. (3)
- [12]**

QUESTION 7

Read the advertisement below.

**Buy a Samsung J5 for only
R229 per month.**

**You have 24 months to pay.
No deposit is required.**

- 7.1 Calculate the total amount to be paid over a period of 24 months. (1)
- 7.2 The monthly instalment, quoted in the advertisement, is calculated on a hire purchase agreement which charges interest of 7,5% p.a. on the cash price of the cellphone. Show that the price of the cellphone is R4 779,13. (2)
- 7.3 Calculate the total interest paid over a period of 24 months if the cellphone is bought with this hire purchase agreement. (1)
- 7.4 The cellphone is insured at 11,5% p.a. of the cash price. The total insurance is calculated and then split up over 24 months. It is then added to the monthly instalment. Calculate the new monthly instalment if the customer wants to insure the cellphone. (3)
- 7.5 The cost of the cellphone is subject to inflation and increases to a cash price of R5 100,00 after 2 years. Calculate the annual inflation rate. (4)
- [11]**

QUESTION 8

8.1 In a random physical sciences experiment, A and B are two different events. It was found that:

$$P(A) = \frac{2}{5}, P(B') = \frac{3}{8} \text{ and } P(A \text{ or } B) = \frac{5}{7}$$

8.1.1 Calculate:

(a) $P(B)$ (2)

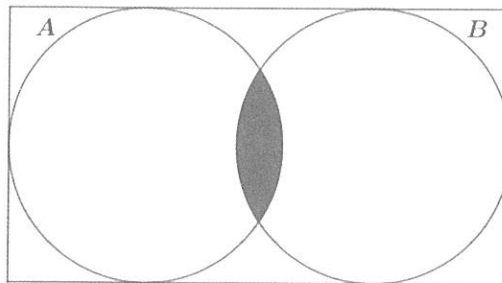
(b) $P(A \text{ and } B)$ (3)

8.1.2 Hence, determine whether events A and B are mutually exclusive. Motivate your answer. (2)

8.2 The Venn diagrams below represent different scenarios of events A and B.

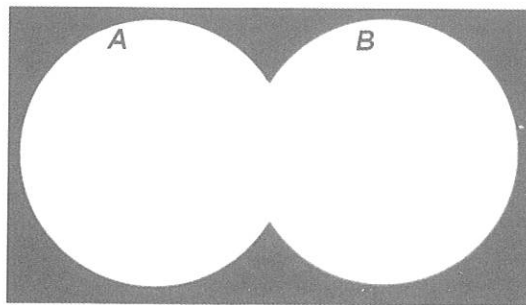
Write down the probability of the shaded region for EACH of the diagrams below.

8.2.1



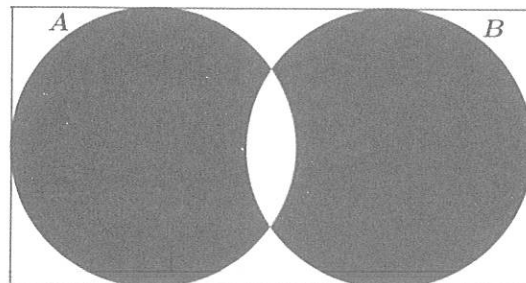
(1)

8.2.2



(1)

8.2.3

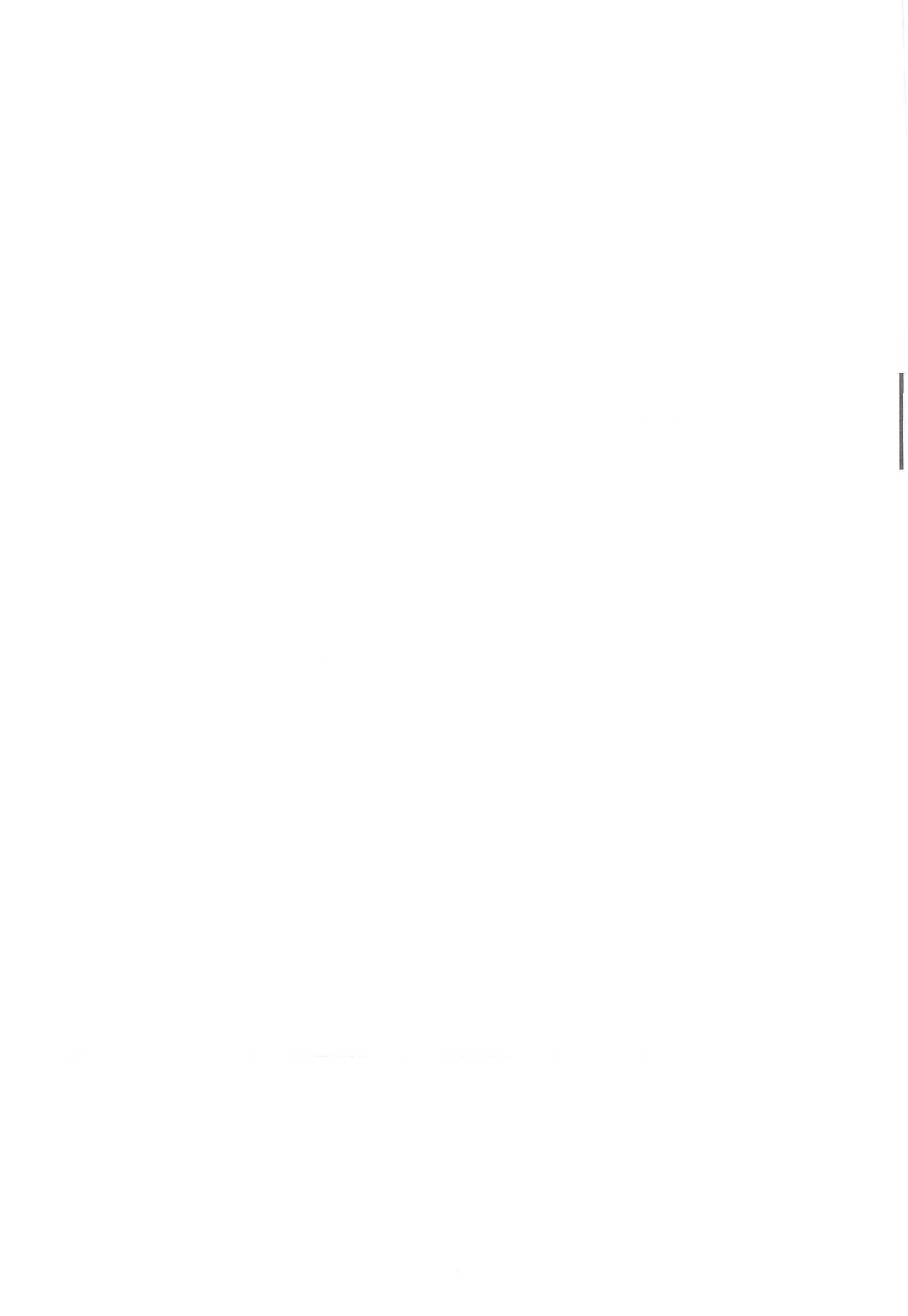


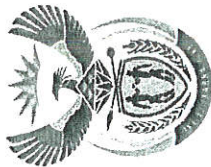
(1)

8.3 Which diagram(s) in QUESTIONS 8.2.1, 8.2.2 or 8.2.3 represent mutually exclusive events? (1)
[11]

TOTAL: 100

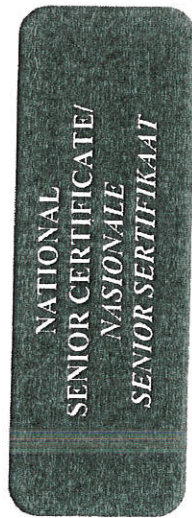






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GRADE/GRAAD 10

MATHEMATICS P1/WISKUNDE VI
NOVEMBER 2018
MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 100

Approved
O. Soudal
11/11/2018

These marking guidelines consist of 11 pages.
Hierdie nasienriglyne bestaan uit 11 bladsye.

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NOTE:

- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:

- As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.
- Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.
- Dit is onaanvaarbaar om waardes/antwoorde te veranderstel om 'n probleem op te los.

QUESTION/VRAAG 1	ANSWER/ANTWOORD	MARKS/PUNTE
1.1.1 $4x - x^3$ $= x(4 - x^2)$ $= x(2 - x)(2 + x)$	OR/OF $4x - x^3$ $= -x(x^2 - 4)$ $= -x(x - 2)(x + 2)$	✓ common factor/gemeenskaplike faktor ✓ difference of two squares/verskil van twee kwadrate (2) ✓ factors/faktore (2)
1.1.2 $x^2 + 15x - 54$ $= (x + 18)(x - 3)$	If correct factors, incorrect signs : 1/2 marks $y - xy + x - 1$ $= y(1 - x) - 1(1 - x)$ $= (y - 1)(1 - x)$	✓ first common factor or group (y - 1) ✓ second common factor ✓ answer (2)
1.1.3 $y - xy + x - 1$ $= y(1 - x) - 1(1 - x)$ $= (y - 1)(1 - x)$	OR/OF $(x + 2)(x^2 - x + 3)$ $= x^3 - x^2 + 3x + 2x^2 - 2x + 6$ $= x^3 + x^2 + x + 6$	✓ simplification/vereenvoudiging ✓ answer/antwoord (2)
1.2.1 $(x + 2)(x^2 - x + 3)$ $= x^3 - x^2 + 3x + 2x^2 - 2x + 6$ $= x^3 + x^2 + x + 6$	Answer only : 2/2 marks $\frac{5 - 3}{x + 3} = \frac{2 - x}{x + 3}$ $= \frac{5(2 - x) - 3(x + 3)}{(x + 3)(2 - x)}$ $= \frac{10 - 5x - 3x - 9}{(x + 3)(2 - x)}$ $= \frac{1 - 8x}{(x + 3)(2 - x)}$	✓ answer/antwoord (3)
1.2.2 $\frac{5 - 3}{x + 3} = \frac{2 - x}{x + 3}$ $= \frac{5(2 - x) - 3(x + 3)}{(x + 3)(2 - x)}$ $= \frac{10 - 5x - 3x - 9}{(x + 3)(2 - x)}$ $= \frac{1 - 8x}{(x + 3)(2 - x)}$	OR	✓ answer/antwoord (3)

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$\frac{5}{x+3} - \frac{3}{2-x}$ $= \frac{5}{(x+3)} + \frac{3}{(x-2)}$ $= \frac{5(x-2) + 3(x+3)}{(x+3)(x-2)}$ $= \frac{5x - 10 + 3x + 9}{(x+3)(x-2)}$ $= \frac{8x - 1}{(x+3)(x-2)}$	<p>✓ $(x+3)(x-2)$ ✓ $5(x-2) + 3(x+3)$</p> <p>✓ answer/antwoord (3)</p>
$25^{-x} \cdot 15^{x+1}$ $= \frac{3^x \cdot 5^{-x}}{5^{2x} \cdot 3^{x+1} \cdot 5^{x+1}}$ $= \frac{3^x \cdot 5^{-x}}{3^x \cdot 5^{-x}}$ $= 5^{-2x+x+1+x} \cdot 3^{x+1-x}$ $= 5^1 \cdot 3^1$ $= 15$	<p>✓ 5^{-2x} ✓ $3^{x+1} \cdot 5^{x+1}$</p> <p>✓ answer/antwoord (3)</p>
$(3p+q)^2$ $= 9p^2 + 6pq + q^2$ $= 9p^2 + q^2 + 6pq$ $= 12 + 6(-3)$ $= -6$	<p>✓ expansion/ontwikkeling</p> <p>✓ subst./verv.</p> <p>✓ answer/antwoord (3)</p> <p style="text-align: right;">18</p>

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<p>QUESTION/VRAAG 2</p> <p>2.1.1 $px + qx = a$ $x(p+q) = a$ $x = \frac{a}{p+q}$; $p \neq -q$</p>	<p>No restriction: 2/2 marks</p> <p>✓ common factor/gemeenskaplike faktor ✓ answer/antwoord (2)</p>
<p>2.1.2 $2x^2 - 5x + 2 = 0$ $(2x-1)(x-2) = 0$ $x = \frac{1}{2}$ or $x = 2$</p>	<p>✓ factors/faktore</p> <p>✓ ca answer from factors/va antwoord van faktors (3)</p>
<p>2.1.3 $\left(\frac{1}{2}\right)^{3x+1} = 32$ $\left(\frac{1}{2}\right)^{3x+1} = \left(\frac{1}{2}\right)^{-5}$ $2^{-3x-1} = 2^5$ $-3x-1 = 5$ $3x = -6$ $x = -2$</p> <p style="text-align: center;">OR/OF</p> <p>$\left(\frac{1}{2}\right)^{3x+1} = 32$ $2^{-3x-1} = 2^5$ $-3x-1 = 5$ $3x = -6$ $x = -2$</p>	<p>✓ $2^{-3x-1} = 2^5$ or $\left(\frac{1}{2}\right)^{3x+1} = \left(\frac{1}{2}\right)^{-5}$ ✓ equating exponents/gelykstelling van eksponente ✓ answer/antwoord (3)</p>
<p>2.2.1 $-11 \leq 3m - 8 < 4$ $-3 \leq 3m < 12$ $-1 \leq m < 4$</p>	<p>✓ $-3 \leq 3m < 12$ ✓ answer/antwoord (2)</p>
<p>2.2.2 5 integers/heelgetalle</p>	<p>✓ answer/antwoord (1)</p>
<p>2.3 $5x + 4y = 21$(1) $2x = 3 - y$(2) $y = 3 - 2x$(3) sub (3) into (1) $5x + 4(3 - 2x) = 21$ $5x - 8x = 21 - 12$ $-3x = 9$ $x = -3$ $y = 3 - 2(-3)$ $y = 9$</p> <p style="text-align: center;">OR/OF</p>	<p>✓ $y = 3 - 2x$ ✓ subst./verv. ✓ x value/x-waarde ✓ y value/y-waarde (4)</p> <p style="text-align: center;">OR/OF</p>

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$5x + 4y = 21$(1) $2x = 3 - y$(2) $x = \frac{3-y}{2}$(3) sub (3) into (1) $5\left(\frac{3-y}{2}\right) + 4y = 21$ $5(3-y) + 8y = 42$ $3y = 27$ $y = 9$ $x = -3$ OR/OF $5x + 4y = 21$(1) $\times 1$ $2x + y = 3$(2) $\times 4$ $5x + 4y = 21$(1) $8x + 4y = 12$(3) $(3) - (1) : 3x = -9$ $x = -3$ Sub from (2) $y = 3 - 2(-3)$ $y = 9$	$\checkmark x = \frac{3-y}{2}$ \checkmark subst./verv. \checkmark y value/y-waarde \checkmark x value/x-waarde (4) OR/OF $\checkmark 8x + 4y = 12$ \checkmark method \checkmark x value/x-waarde \checkmark y value/y-waarde (4)
	[15]

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QUESTION/VRAAG 3	ANSWER/ANTWOORD
3.1 $T_1 = 11$	\checkmark answer/antwoord (1)
3.2 $T_n = pn + q$ $= -3n + q$ $14 = -3(3) + q$ $q = 23$ $T_n = -3n + 23$	\checkmark common difference = -3 \checkmark answer (2)
3.3 $T_n = -3n + 23$ $-3n + 23 = -103$ $3n = 126$ $n = 42$	\checkmark equating to -103/ gekykstelling aan -103 \checkmark answer/antwoord (2)
3.4 $T_n < 0$ $-3n + 23 < 0$ $-3n < -23$ $n > \frac{23}{3}$ $\therefore n = 8$ OR/OF 20 ; 17 ; 14 ; 11 ; 8 ; 5 ; 2 ; -1 $n = 8$ terms	$\checkmark T_n < 0$ \checkmark simplification/ vereenvoudiging \checkmark correct conclusion, i.e $n = 8$ korrekte afleiding, m.a.w. $n = 8$ (3) \checkmark expansion \checkmark answer (3)
3.5 $T_n = -3n + 23$ $T_{37} = -3(37) + 23$ $T_{37} = -88$ OR/OF $T_n = -6n + 26$ $T_{19} = -6(19) + 26$ $T_{19} = -88$ OR/OF 20 ; 17 ; 14 ; 11 ; 8 ; 5 ; 2 ; -1 ; -4 ; -7 ; -10 ; -13 ; -16 ; -19 ; -22 ; -25 ; -28 ; -31 ; -34 ; -37 ; -40 ; -43 ; -46 ; -49 ; -52 ; -55 ; -58 ; -61 ; -64 ; -67 ; -70 ; -73 ; -76 ; -79 ; -82 ; -85 ; -88 Answer = -88	$\checkmark -3(37) + 23$ \checkmark answer/antwoord (2) $\checkmark -6(19) + 26$ \checkmark answer/antwoord (2) \checkmark expansion \checkmark answer (2)

10

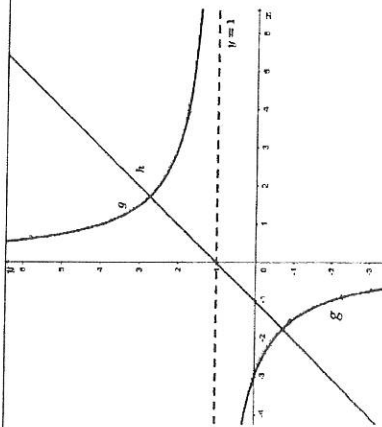
QUESTION/VRAAG 4	ANSWER/ANTWOORD	MARKS
4.1.1 $4^2 = 16$	✓ answer/antwoord	(1)
4.1.2 $13^2 = 169$	✓ answer/antwoord	(1)
4.1.3 $T_n = n^2$	✓ answer/antwoord	(1)
4.2 $T_n = 2n - 1$ $43 = 2n - 1$ $44 = 2n$ $n = 22$ Total dots = $n^2 = 22^2$ = 484	✓ $T_n = 2n - 1$ ✓ $n = 22$ ✓ answer/antwoord	(3)
OR/OF $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 + 25 + 27 + 29 + 31 + 33 + 35 + 37 + 39 + 41 + 43$ = 484	✓ correct expansion ✓ answer	(3)
		[6]

5.2.2	$f(x) = ax^2 + q$ $3 = a(1)^2 + q$ at E(1 ; 3) $3 = a + q$(1) $0 = a(-2)^2 + q$ at A(-2 ; 0) or B(2 ; 0) $0 = 4a + q$ $q = -4a$(2) $a = -1$ $q = 4$ OR/OF $y = a(x-2)(x+2)$ $3 = a(1-2)(1+2)$ $3 = -3a$ $a = -1$ $y = -(x^2 - 4)$ $y = -x^2 + 4$ $q = 4$	✓ subst. (1 ; 3)/ verv. (1 ; 3) ✓ subst. coordinates of A or B/verv. die coördinate van A of B ✓ a value/a-waarde ✓ q value/q-waarde (4) ✓ $y = a(x-2)(x+2)$ ✓ subst of (1 ; 3) ✓ a value
5.3.1	C(0 ; 4) D(0 ; -3) CD = $y_c - y_D$ = $4 - (-3)$ = 7 units/eenhede OR/OF $CD = \sqrt{(0-0)^2 + (4-(-3))^2}$ = $\sqrt{49}$ = 7 Answer only: 2/2 marks	✓ C(0 ; 4) (indicated or implied) ✓ answer/antwoord (2) ✓ C(0 ; 4) (indicated or implied) ✓ answer/antwoord (2)
5.3.2	$m = \frac{0-(-3)}{-2-(0)}$ $m = -\frac{3}{2}$ $y = -\frac{3}{2}x - 3$	✓ subst. into gradient/verv. ✓ m value/m-waarde ✓ equation/ vergelyking (3)
5.4.1	$-2 < x < 2$ OR $x \in (-2 ; 2)$	✓ critical values/ kritieke waardes ✓ notation/notasie (2)
5.4.2	$x > 0$ OR $x \in (0 ; \infty)$	✓ answer/antwoord (1)

QUESTION/VRAAG 5	ANSWER/ANTWOORD	MARKS
5.1.1 D(0 ; -3)	✓ x value/x-waarde	(2)
5.1.2 $y > -4$	✓ y value/y-waarde	(2)
OR/OF $y \in (-4 ; \infty)$	✓ answer/antwoord	(1)
5.2.1 $0 = \left(\frac{1}{2}\right)^x - 4$ $2^{-x} = 4$ $2^x = 2^2$ $x = -2$ A(-2 ; 0)	✓ equating g to 0/ gelykstelling aan 0 ✓ answer as a coördinate/antwoord as 'n koördinaat (2)	

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QUESTION/VRAAG 6	
6.1.1	$g(x) = \frac{a}{x} + q$ $2 = \frac{a}{3} + 1$ $a = 3$ $\therefore g(x) = \frac{3}{x} + 1$
6.1.2	$h(x) = x + 1$
6.2	<p>Answer only: 2/2 marks</p> 
6.3	$f(x) = -\left(\frac{3}{x} + 1\right) + 5$ $f(x) = -\frac{3}{x} + 4$ <p>The equations of the asymptotes are: $x = 0$ $y = 4$</p>
	<p>Answer only: 3/3 marks</p>
	<p>[12]</p>

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QUESTION/VRAAG 7	
7.1	<p>Total amount paid /Totale bedrag betaal $= R\ 229 \times 24$ $= R\ 5\ 496$</p>
7.2	$A = P(1 + i \cdot n)$ $5\ 496 = P(1 + 0,075 \times 2)$ $P = R\ 4\ 779,13$
7.3	<p>Interest/Rente $= R\ 5\ 496 - R\ 4\ 779,13$ $= R\ 716,87$</p>
7.4	<p>Insurance/Versekering $= \frac{R\ 4779,13 \times 0,115}{12}$ $= R\ 45,80$</p> <p>New monthly payments/Nuwe maandelikse betaling $= R\ 45,80 + R\ 229$ $= R\ 274,80$</p> <p>OR/OF Total insurance $= 4779,13 \times 0,115 \times 2$ $= R\ 1\ 099,20$</p> <p>Total cost $= 5\ 496 + 1\ 099,20$ $= R\ 6595,20$</p> <p>Total monthly payment $= \frac{6595,20}{24}$ $= R\ 274,80$</p>
	<p>2018 -11- 12 PROVED MARKING GUIDELINE UP-ING EXAMINATION</p>
	<p>Total insurance per month $= \frac{1099,20}{24}$ $= 45,80$</p> <p>Total monthly payment $= R\ 229 + R\ 45,80$ $= R\ 274,80$</p>

<p>7.5</p> <p>$A = P(1+i)^n$</p> <p>$5100 = 4779,13(1+i)^2$</p> <p>$i = \sqrt[2]{1,067139835} - 1$</p> <p>$i = 0,03302460526$</p> <p>Inflation rate/<i>inflasiekoers</i> = 3,30%</p>	<p>✓ formula/<i>formule</i></p> <p>✓ correct subst. of A and P/<i>verv.</i></p> <p>✓ simplification/<i>vereenvoudiging</i></p> <p>✓ answer/<i>antwoord</i> (4)</p> <p>[11]</p>
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QUESTION/VRAAG 8		
8.1.1 (a)	$P(B) = 1 - P(B')$ $= 1 - \frac{3}{8}$ $= \frac{5}{8}$	<p>✓ formula</p> <p>✓ answer/<i>antwoord</i> (2)</p>
8.1.1 (b)	<p>$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$</p> $\frac{5}{7} = \frac{2}{5} + \frac{5}{8} - P(A \text{ and } B)$ <p>$P(A \text{ and } B) = \frac{87}{280}$ $= 0,31$</p>	<p>✓ identity</p> <p>✓ subst./<i>herv.</i></p> <p>✓ answer/<i>antwoord</i> (3)</p>
8.1.2	Not mutually exclusive events. $P(A \text{ and } B) \neq 0$	<p>✓ NOT/NIE</p> <p>✓ reason/<i>rede</i> (2)</p>
8.2.1	$P(A \cap B)$ OR/OF $P(A \text{ and } B)$	<p>✓ answer/<i>antwoord</i> (1)</p> <p>✓ answer/<i>antwoord</i> (1)</p>
8.2.2	$P(A \cup B)$ OR/OF $P(A \text{ or } B)$ OR/OF $1 - P(A \text{ or } B)$	<p>✓ answer/<i>antwoord</i> (1)</p> <p>✓ answer/<i>antwoord</i> (1)</p> <p>✓ answer/<i>antwoord</i> (1)</p> <p>✓ answer/<i>antwoord</i> (1)</p>
8.2.3	$P(A \text{ or } B) - P(A \text{ and } B)$ OR/OF $P(\text{only } A) + P(\text{only } B)$	<p>✓ answer/<i>antwoord</i> (1)</p> <p>✓ answer/<i>antwoord</i> (1)</p>
8.3	8.2.3	<p>✓ answer/<i>antwoord</i> (1)</p> <p>[11]</p>
TOTAL/TOTAAL		[100]

**GRADE 10 MATHEMATICS
NOVEMBER 2018 : PAPER 1
ADDENDUM TO THE MARKING GUIDELINES**

2018 -11- 12

**APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION**

These notes have been created to provide options that learners may use and the appropriate mark allocation for their answers.

1.2.3	The mark for 5^{-2x} is NOT for $(5^2)^{-x}$	
1.3	$(3p+q)^2$ $= 9p^2 + q^2$ $= 9p^2 + q^2$ $= 12$	Award : 1/3 marks
2.2.2	If the candidate list the integers: -1 ; 0 ; 1 ; 2 ; 3	Award : 1/1 marks
3.2	$T_n = a + (n-1)d$ $= 20 + (n-1)(-3)$ $= -3n + 23$	✓ common difference = -3 ✓ answer (2)
3.3	ca the answer -- provided the n does not work out to be negative or a fraction.	
3.4	If $T_n = -1$ $-3n + 23 = -1$ $-3n = -24$ $n = 8$	Award max: 2/3 marks
3.5	$T_{19} = -3(19) + 23$ $= -34$	Award: 0/2 marks
5.1.1	Accept: $x = 0$ $y = -3$	
5.2.1	A must be in coordinate form.	
6.1.2	If the candidate leaves the answer as: $h(x) = x + q$	Award: 2 / 2 marks
6.2	The shape mark for g is for 2 arms being in the correct positions	
7.5	<ul style="list-style-type: none"> • If $n = 24$; $i = 27,11\%$: award 3 / 4 marks • If A and P are swapped, max: 1 / 4 marks (answer is $-3,19\%$) • 	
8.1.2	If a candidate answers NOT mutually exclusive with NO reason: award 1 / 2 marks	

8.2	Candidates may use the values from question 8.1. If they do, these are the answers and the subsequent mark allocations:	
8.2.1	$P(A \text{ and } B)$ $= \frac{87}{280}$	✓ answer
8.2.2	$P(A \text{ or } B)'$ $= \frac{2}{7}$	✓ answer
8.2.3	$P(A \text{ or } B) - P(A \text{ and } B)$ $= \frac{5}{7} - \frac{87}{280}$ $= \frac{113}{280}$	✓ answer

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