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education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT/
PROVINSIALE ASSESSERING

GRADE 11/*GRAAD* 11

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2025

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

These marking guidelines consist of 12 pages.
Hierdie nasienriglyne bestaan uit 12 bladsye.

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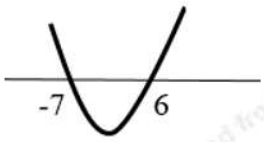
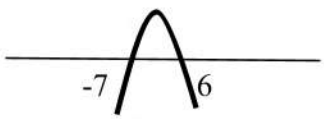
NOTE:

- If a candidate answered a question TWICE, only mark the FIRST attempt.
- Consistent accuracy applies in ALL aspects of the marking guideline.

LET WEL:

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toegepassing.

QUESTION/ VRAAG 1

1.1.1	$x^2 - 11x = -24$ $x^2 - 11x + 24 = 0$ $\therefore (x-8)(x-3) = 0$ $\therefore x = 8 \text{ or } \mid of\ x = 3$ Answer only: 3/3	✓ standard form/*stdvorm* ✓ factors/*faktore* ✓both answers/*beide antwe* (3)
1.1.2	$5x^2 - x - 8 = 0$ $\therefore x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(5)(-8)}}{2(5)}$ $\therefore x = 1{,}37 \text{ or } \mid of\ x = -1{,}17$ Pen. rounding (only 1 mark) Answer only: 3/3	✓ substitution ✓✓ each answ/*elke antw* (3)
1.1.3	$42 > x^2 + x$ $x^2 + x - 42 < 0$ $(x+7)(x-6) < 0$  $\therefore \quad -7 < x < 6$ OR/OF $42 > x^2 + x$ $-x^2 - x + 42 > 0$ $(x+7)(6-x) < 0$  $\therefore \quad -7 < x < 6$	✓ standard form/vorm ✓ critical values *kritiese waardes* ✓✓ answer/*antw* ✓ standard form/vorm ✓ critical values *kritiese waardes* ✓✓ answer/*antw* (4)

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1.1.4	$\frac{4}{x^2-4}-\frac{10}{x^2-x-6}=\frac{1}{x+2}$ $\frac{4}{(x-2)(x+2)}-\frac{10}{(x-3)(x+2)}=\frac{1}{(x+2)}$ $4(x-3)-10(x-2)=(x-3)(x-2)$ $4x-12-10x+20=x^2-5x+6$ $x^2+x-2=0$ $(x+2)(x-1)=0$ $x=-2$ *NA / nvt* or/of $x=1$	✓✓ factors/*faktore* ✓ × LCM/KGV (eliminating denominator) ✓standard form ✓ factors/faktore ✓ answer/antw (6)
1.2	$2x-y-1=0$.....(1) $x^2-2xy+2x-y^2=0$.....(2) $y=2x-1$.....(3) sub. equ.(3) into equ.(2) $x^2-2x(2x-1)+2x-(2x-1)^2=0$ $x^2-4x^2+2x+2x-4x^2+4x-1=0$ $-7x^2+8x-1=0$ $7x^2-8x+1=0$ $(7x-1)(x-1)=0$ $x=\frac{1}{7}$ or/of $x=1$ $y=2\left(\frac{1}{7}\right)-1=-\frac{5}{7}$ $y=2(1)-1=1$ 2nd mistake: BD Last mark independent of # mistakes Leading to linear: Max. 2/6	✓ *y* subject/*onderwerp* (3rd equation) ✓ substitution ✓ standard form/*std vorm* ✓ factors/*faktore* ✓ both *x*-values/*beide x-w* ✓ both *y*-values/*beide y-w* (6)
1.3	$k^2+5x+k=0$ $\Delta=b^2-4ac$ $=(5)^2-4(k)(k)$ $=25-4k^2$ Integer values for which Δ is perfect square: *Heelgetalle waarvoor* Δ *'n volkome vierkant is:* $k=0;\ \pm 2$ OR/*OF* Answer only: 0/4	✓ substitution $(5)^2-4(k)(k)$ ✓ $25-4k^2$ ✓ Δ Perfect square ✓ $k=0;\ \pm 2$

	$kx^2 + 5x + k = 0$ $\Delta \geq 0$ and Δ is perfect square $b^2 - 4ac \geq 0$ $(5)^2 - 4(k)(k) \geq 0$ $25 - 4k^2 \geq 0$ $(5 - 2k)(5 + 2k) \geq 0$ $-\frac{5}{2} \leq k \leq \frac{5}{2} \quad k \in Z$ $k = 0;\ \pm 1;\ \pm 2$ $\therefore k = 0;\ \pm 2$	✓ $(5)^2 - 4(k)(k) \geq 0$ ✓ $(5 - 2k)(5 + 2k) \geq 0$ ✓ $-\frac{5}{2} \leq k \leq \frac{5}{2} \quad k \in Z$ ✓ $k = 0;\ \pm 2$ (4)
1.4	$x = \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \ldots}}}}}$ $x^2 = 30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \ldots}}}}}$ $x^2 = 30 + x$ $x^2 - x - 30 = 0$ $(x - 6)(x + 5) = 0$ $x = 6; \quad x \neq -5$	✓ square both sides/*kwadreer* ✓ substitution of '' x'' ✓standard form/stdvorm ✓factors ✓ $x = 6 \quad x \neq -5$ (5) Answer only: 0/5
		[31]

QUESTION/VRAAG 2

2.1	$\frac{2^{x+3} - 3.2^{x-1}}{2^{x-2}} = \frac{2^x.2^3 - 3.2^x.2^{-1}}{2^x.2^{-2}} = \frac{2^x(2^3 - 3.2^{-1})}{2^x.2^{-2}}$ $= \frac{8 - \frac{3}{2}}{\frac{1}{4}} = \frac{13}{2} \times 4 = 26$	✓ Factorize/*faktoriseer* ✓simpl & + exp/vereenv & +eksp ✓ 26 (3)
2.2.1	$x^{\frac{3}{5}} = -8$ $\therefore \left(x^{\frac{3}{5}}\right)^{\frac{5}{3}} = ((-2)^3)^{\frac{5}{3}}$ $\therefore x = (-2)^5 = -32$ Answer only: 2/2	✓ power/*mag* $\frac{5}{3}$ ✓ -32 (2)

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2.2.2	$4^x - 9.2^x = -8$ $2^{2x} - 9.2^x + 8 = 0$ $(2^x - 8)(2^x - 1) = 0$ $2^x = 8 = 2^3$ or/of $2^x = 1 = 2^0$ $x = 3$ or/of $x = 0$	✓ $4^x = 2^{2x}$ ✓ standard form/*std vorm* ✓ factors/*faktore* ✓ both equation/*beide vgl* ✓ $x = 3$ ✓ $x = 0$ (6)
2.2	$\frac{3^{y+1}}{32} = \sqrt{96^x}$ $\frac{3^{y+1}}{2^5} = \sqrt{(2^5.3)^x}$ $(2)^{-5}.(3)^{y+1} = (2)^{\frac{5}{2}x}.(3)^{\frac{1}{2}x}$ $-5 = \frac{5}{2}x$ $x = -2$ $y+1 = \frac{1}{2}x$ $y+1 = \frac{1}{2}(-2)$ $y = -2$	✓ prime bases/priem grondtalle ✓ exponential laws/ekspwette ✓equating exponents/ eksp = ✓ $x = -2$ ✓ $y = -2$ (5)
		[16]

QUESTION/VRAAG 3

3.1	1; 3; 5;….; 119 $T_n = dn + c = 2n + c$ $1 = 2(1) + c$ $c = -1 \Rightarrow T_n = 2n - 1$	✓ $2n$ ✓ $c = -1$ (2)
3.2	$T_{20} = 2(20) - 1 = 39$ Answer only: 2/2	✓ substitution ✓ 39 (2)
3.3	$119 = 2n - 1$ $n = 60$ Answer only: 2/2	✓substitution ✓$n = 60$ (2)
3.4	10; 1; 10; 3; 10; 5; 10; … ; 10; 119; 10. Original sequence/*oorspronklike ry:* 1 ; 3 ; 5 ; …. ; 119 Number of terms in the combined sequence/*aantal terme in gekombineerde reeks* : $60 + 61 = 121$	✓ +61 ✓ 121 (2) Answer only: 1/2

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3.5	$T_{98} = 2(98) - 1 = 195$ $Q_{98} = 9632 - 195 = 9437$	✓ substitution $T_{98} = 2(98) - 1$ ✓ 195 ✓ 9437 (3)
		[11]

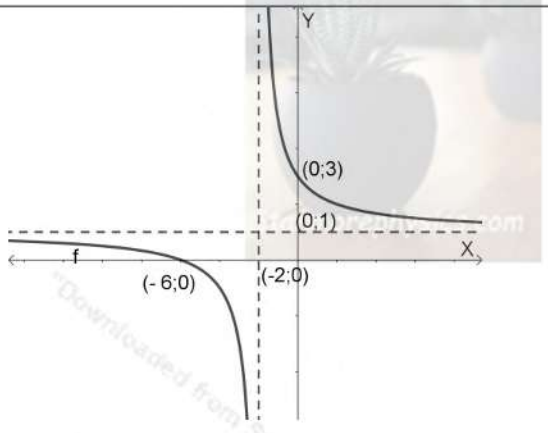
QUESTION/VRAAG 4

4.1	-7 ; -22 ; -35 ; -46 ; ….. 1stD/1eV: -15 ; -13 ; -11 2ndD/2eV: 2 2 $T_5 = -55$	✓ -55 (1)
4.2	$2a = 2$ $a = 1$ $3a + b = -5$ $3(1) + b = -15$ $b = -18$ $a + b + c = -7$ $1 + -18 + c = -7$ $c = 10$ $T_n = n^2 - 18n + 10$ Answer only: 1/4	✓ $a = 1$ ✓ $b = -18$ ✓ $c = 10$ ✓ $T_n = n^2 - 18n + 10$ (4)
4.3	$T_n = n^2 - 18n + 10 = 29$ $n^2 - 18n - 19 = 0$ $(n - 19)(n + 1) = 0$ $n = 19 \quad n \neq -1$	✓ $n^2 - 18n + 10 = 29$ ✓ standard form/*std vorm* ✓ factors/*faktore* ✓ *slegs* $n = 19 \quad n \neq -1$ (4)

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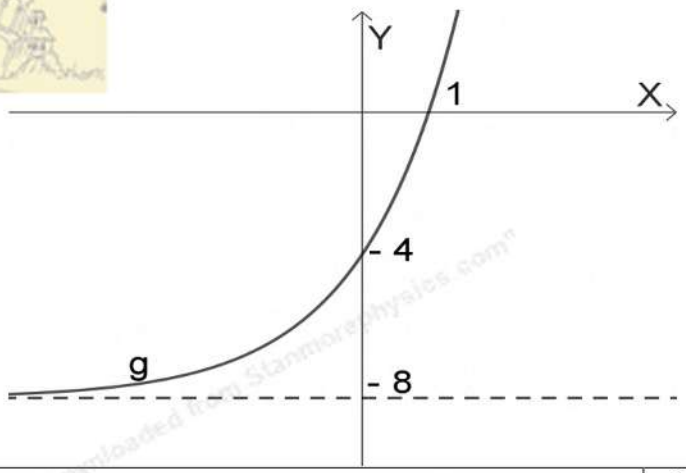
4.4	$-15;\ -13;\ -11;....$ $2n-17=29$ $n=23$ Between T_{24} and T_{23} OR/OF $T_{n+1}-T_n=29$ $(n+1)^2-18(n+1)+10-\left(n^2-18n+10\right)=29$ $n^2+2n+1-18n-18+10-n^2+18n-10=29$ $2n-17=29$ $2n=46$ $n=23$ Between T_{24} and T_{23}	✓ $2n-17$ ✓ substitution $2n-17=29$ ✓answer/*antw* T_{24} & T_{23} (3)
		[12]

QUESTION/VRAAG 5

5.1	$x=-2$ and/*en* $y=1$	✓✓ each answer/elke antw (2)
5.2	$f(0)=\frac{4}{0+2}+1=3\ \therefore (0;\ 3)$ NB must be coordinates *Moet koördinate wees*	✓ answer/antw (1)
5.3	$0=\frac{4}{x+2}+1$ $-x-2=4$ $x=-6$	✓ $y=0$ ✓ $x=-6$ (2)
5.4		✓both intercepts/beide afsnitte ✓ both asymptotes /beide asimptote ✓ shape/vorm (3)
5.5	$x\neq -2,\ x\in R$ or/of $x\in(-\infty;-2)$ or/*of* $(-2;\infty)$	Answer only: 2/2 ($x\neq -2$) ✓ $x\neq -2$ ✓ $x\in R$ OR/OF ✓✓ each ( ) /elke hakie (2)

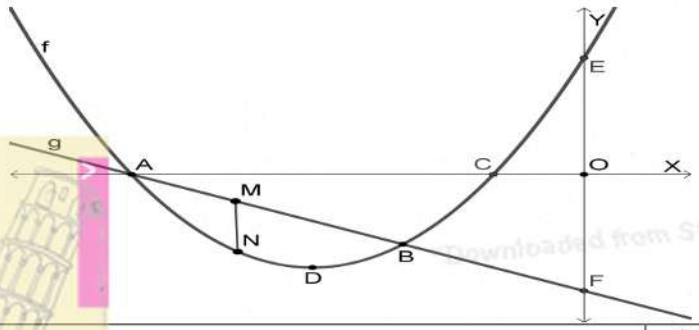
5.6	$y = -x + c \quad (-2;1)$ $1 = -(-2) + c$ $c = -1$ $y = -x - 1$ Answer only: 3/3	✓ $m = -1$ ✓ subs $(-2;\ 1)$ ✓ equation/vgl (3)
		[13]

QUESTION/VRAAG 6



6.1	$q = -8$	✓ $q = -8$ (1)
6.2	$-4 = a.b^0 - 8$ $a = 4$ $g(x) = 4.b^x - 8$ $0 = 4.b^1 - 8$ $b = 2$ $g(x) = 4.2^x - 8$ Answer only: 2/4	✓ substitution $(0;\ -4)$ ✓ $a = 4$ ✓ substitution $(1;\ 0)$ ✓ $b = 2$ (4)
6.3	$y > -8,\ y \in R$ Answer only: 2/2 ($y > -8$)	✓ $y > -8$ ✓ $y \in R$ (2)
6.4	$k(x) = -g(x-2)$ $k(x) = -4.2^{x-2} + 8$ $k(x) = -2^2.2^{x-2} + 8$ $k(x) = -2^x + 8$ Answer only: 4/4	✓ -4 & $+8$ ✓ exponent $x - 2$ ✓exponential laws/eksp wette ✓ answer/*antw* (4)
		[11]

QUESTION/VRAAG 7

		
7.1	$x = -\frac{b}{2a} = -\frac{6}{2(1)} = -3$ $f(-3) = (-3)^2 + 6(-3) + 5 = -4$ D$(-3;\ -4)$	✓ $x = -3$ ✓ substitution: $f(-3)$ ✓ $y = -4$ (3)
7.2.1	$E(0;\ 5)$ & F$(0;\ -5)$ EF $= 5 - (-5) = 10$ units/*eenhende*	✓ E & F ✓ answer/antw (2)
7.2.2	For / Vir A & C : $x^2 + 6x + 5 = 0$ $(x + 5)(x + 1) = 0$ $x_A = -5$ or / of $x_C = -1$ AC $= -1 - (-5) = 4$ units/*eenhende*	✓ $y = 0$ ✓ $x = -5$ & $x = -1$ ✓ AC = 4 (3)
7.3.1	$g(x) = f(x)$ $-x - 5 = x^2 + 6x + 5$ $x^2 + 7x + 10 = 0$ $(x + 5)(x + 2) = 0$ $x_A = -5 \quad x_B = -2$ $y_B = g(-2) = -(-2) - 5 = -3$ B$(-2;\ -3)$	✓ equating/gelykstel ✓ factors/faktore ✓ choose $x = -2$ /kies $x = -2$ ✓ $y = -3$ (4)
7.3.2	$-5 < t < -2$	✓ interval ✓ notation/notasie (2)
7.4.1	MN $= g(x) - f(x) = -x - 5 - (x^2 + 6x + 5)$ $= -x^2 - 7x - 10$	✓ $g(x) - f(x)$ ✓answer/antw (2)
7.4.2	$x = \frac{-(-7)}{2(-1)} = -\frac{7}{2} = -3,5$ Max. $= -(-3,5)^2 - 7(-3,5) - 10 = \frac{9}{4} = 2,25$	✓ $x = -3,5$ ✓ $\frac{9}{4} = 2,25$ (2)
7.4.3	$k > \frac{9}{4}$	✓✓answer/antw (2)

7.5	$k \geq -1$ or/of $k = -5$	✓ $k \geq -1$ ✓ $k = -5$ (2)
		[21]

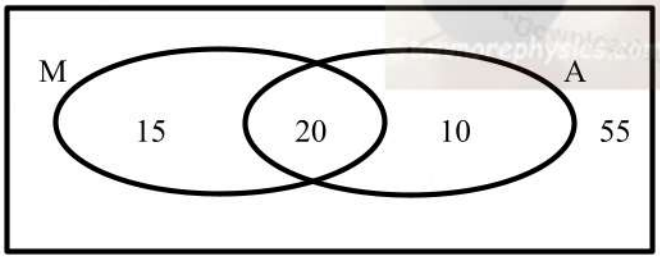
QUESTION/VRAAG 8

8.1.1	$1 + i_{eff} = \left(1 + \frac{i_n}{n}\right)^n$ *A:* $1 + i_{eff} = \left(1 + \frac{0{,}082}{365}\right)^{365} = 1{,}085445813$ $i_{eff} = 0{,}085445813 = 8{,}54\%$	✓ substitution in correct formula ✓ $i = 8{,}54\%$ (2)
8.1.2	*B:* $1 + i_{eff} = \left(1 + \frac{0{,}083}{12}\right)^{12} = 1{,}086231401$ $i_{eff} = 0{,}086231401 = 8{,}62\%$ $\therefore$ *B is better/beter*	✓ $i = 8{,}62\%$ ✓ B (2)
8.2.1	T_0 T_1 T_2 T_3 T_4 T_5 T_6 300 000 (175 000) 9% p.a. comp quat 8,5% p.a. c.month Money from investment/*Geld van belegging*: $A = P(1+i)^n$ $A = 300000\left(1+\frac{0{,}09}{4}\right)^{16}\left(1+\frac{0{,}085}{12}\right)^{24}$ $-175000\left(1+\frac{0{,}09}{4}\right)^{8}\left(1+\frac{0{,}085}{12}\right)^{24}$ $= R259\,652{,}50$ OR/OF At T_2 : $A = 300000\left(1+\frac{0{,}09}{4}\right)^{8} - 175000 = 183449{,}34$ At T_6 : $A = 183449{,}43\left(1+\frac{0{,}09}{4}\right)^{8}\left(1+\frac{0{,}085}{12}\right)^{24}$ $= R259\,652{,}50$	✓ $300000\left(1+\frac{0{,}09}{4}\right)^{16}$ ✓ $\left(1+\frac{0{,}085}{12}\right)^{24}$ ✓ $175000\left(1+\frac{0{,}09}{4}\right)^{8}$ ✓ $\left(1+\frac{0{,}085}{12}\right)^{24}$ ✓ R259 652,50 or/of ✓ $300000\left(1+\frac{0{,}09}{4}\right)^{8} - 175000$ ✓ 183449 ,34 ✓ $183449{,}43\left(1+\frac{0{,}09}{4}\right)^{8}$ ✓ $\left(1+\frac{0{,}085}{12}\right)^{24}$ ✓ R259 652,50 (5)

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8.2.2	$A = P(1+i)^n$ $A = 175000(1+0{,}08)^4$ $= 238\,085{,}57$ Difference $= 259\,652{,}50 - 238\,085{,}57 = R21\,566{,}93$ Not fair, younger brother gets effectively more Nie regverdig nie, jonger broer kry effektief meer	✓ i & n indep. of formula ✓substitution in correct formula ✓ R238 085,57 ✓conclusion/gevolgtrekking (4)
8.2.3	$A = P(1-i)^n$ $\therefore 79\,120 = 175\,000(1-i)^4$ $\frac{79120}{175000} = (1-i)^4$ $\therefore \sqrt[4]{\frac{79120}{175000}} = 1 - i$ $\therefore\ i = 0{,}180003389 = 18\%$	✓ substitution in correct formula/*subst in regte form* ✓ $\frac{79120}{175000} = (1-i)^4$ ✓ $\sqrt[4]{\left(\frac{79120}{175000}\right)} = 1-i$ ✓ answer/*antw* (4)
		[17]

QUESTION/VRAAG 9

9.1.1	No, M and A are NOT mutually exclusive/ *Nee,* M *en A is NIE onderling uitsluitend nie* because $P(\text{M and A}) = \frac{20}{100} = \frac{1}{5} = 0{,}2 \neq 0$	✓No/*Nee* ✓reason/rede (2)
9.1.2	$P(M) \times P(A) = \frac{35}{100} \times \frac{30}{100} = 0{,}105$ $P(\text{M and A}) = 0{,}2$ $0{,}2 \neq 0{,}105$ $\therefore$ M and A are not independent events/*nie onafhanklik nie*	✓ $\frac{35}{100} \times \frac{30}{100}$ ✓0,105 ✓0,2 ✓ conclusion/gevolgtrekking (4)
9.1.3		✓ 15 ✓ 10 ✓55 (3)

9.1.4	$P(M' \text{ or } A) = \frac{20+10+55}{100} = \frac{85}{100} = \frac{17}{20} = 0{,}85$ **OR/OF** $P(M' \text{ or } A) = P(M') + P(A) - P(M' \text{ and } A) = \frac{65}{100} + \frac{30}{100} - \frac{10}{100} = 0{,}85$ **OR/OF** $P(M' \text{ or } A) = 1 - P(M \text{ and } A') = 1 - \frac{15}{100} = 0{,}85$ Answer only: 2/2	✓ 85 ✓ answer/antw OR/OF ✓ substitution in correct formula ✓ answer/antw OR/OF ✓ substitution in correct formula ✓ answer/antw (2)
9.2	Let numberr of red balls be = *x/ Stel aantal rooi balle = x* $P(RR) = \frac{x}{25} \times \frac{x-1}{24} = \frac{11}{60}$ $\frac{x^2-x}{600} = \frac{11}{60}$ $x^2 - x - 110 = 0$ $(x-11)(x+10) = 0$ $x = 11 \quad x \neq -10$ 11 red balls/*rooi balle* and 14 blue balls/*blou balle.*	✓ $\frac{x}{25}$ ✓ $\frac{x-1}{24}$ ✓ prod = $\frac{11}{60}$ ✓ factors/faktore ✓11 red balls/*rooi balle* ✓14 blue balls/*blou balle.* (6) Answer only: 0/6
		[17]
		TOTAL: 150 ***TOTAAL : 150***

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