



Province of the  
**EASTERN CAPE**  
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo  
Provinsie van die Oos Kaap: Departement van Onderwys  
Poratensie Ya Kapa Botjhabela: Lerapha la Thuto

**NATIONAL  
SENIOR CERTIFICATE  
NASIONALE  
SENIORSERTIFIKAAT**

**GRADE/GRAAD 11**

**NOVEMBER 2024**

**MATHEMATICS P1 / *WISKUNDE V1*  
MARKING GUIDELINE / *NASIENRIGLYN***

**MARKS/PUNTE: 150**

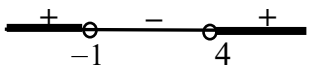
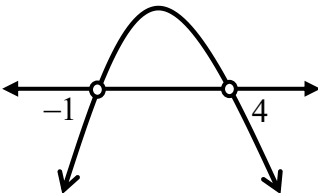
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This marking guideline consists of 16 pages.  
*Hierdie nasienriglyn bestaan uit 16 bladsye.*

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**NOTE/NOTA:**

- If a candidate answered a question TWICE, mark the FIRST attempt ONLY.  
*Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, merk SLEGS die EERSTE poging.*
- Consistent accuracy (CA) applies in ALL aspects of the marking guideline.  
*Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die nasienriglyn.*
- If a candidate crossed out an attempt of a question and did not redo the question, mark the crossed-out attempt.  
*Indien 'n kandidaat 'n poging vir 'n vraag deurgetrek het en nie die vraag weer beantwoord het nie, merk die poging wat deurgetrek is.*
- The mark for substitution is awarded for substitution into the correct formula.  
*Die punt vir vervanging word toegeken vir vervanging in die korrekte formule.*

QUESTION 1/VRAAG 1		
1.1	1.1.1	$x^2 - 2x - 8 = 0$ $(x - 4)(x + 2) = 0$ $x - 4 = 0$ or/of $x + 2 = 0$ $x = 4$ or/of $x = -2$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;">                     Answers only – Full Marks                      Slegs antwoorde – Volpunte                 </div>
	1.1.2	$2x^2 - 3x - 7 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)}$ $\therefore x = 2,77$ or/of $x = -1,27$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;">                     Penalise 1 mark for                      incorrect rounding off./                      Penaliseer 1 punt vir                      verkeerde afronding.                 </div>
	1.1.3	$(x + 1)(4 - x) > 0$ $(x + 1)(x - 4) < 0$ critical values/kritieke waardes $x = -1$ or/of $x = 4$  $-1 < x < 4$ , but/maar $x \in \mathbb{N}$ $\therefore x \in \{1; 2; 3\}$ <p style="text-align: center;"><b>OR/OF</b></p> $x \in (-1; 4)$ , but/maar $x \in \mathbb{N}$ $\therefore x = 1$ or/of $x = 2$ or/of $x = 3$ <p style="text-align: center;"><b>OR/OF</b></p> $(x + 1)(4 - x) > 0$ critical values/kritieke waardes $x = -1$ or/of $x = 4$  $-1 < x < 4$ , but/maar $x \in \mathbb{N}$ $\therefore x \in \{1; 2; 3\}$

- ✓  $x = -4$
- ✓  $x = -2$  (2)
- ✓ standard form / *standaardvorm*
- ✓ substitution / *vervanging*
- ✓✓  $x$ -values /  $x$ -waardes (4)
- ✓ critical values / *kritieke waardes*
- ✓  $-1 < x < 4$ , but/maar  $x \in \mathbb{N}$
- ✓  $\therefore x \in \{1; 2; 3\}$
- OR/OF**
- ✓ critical values / *kritieke waardes*
- ✓  $x \in (-1; 4)$ , but/maar  $x \in \mathbb{N}$
- ✓  $\therefore x = 1$  or/of  $x = 2$  or/of  $x = 3$
- OR/OF**
- ✓ critical values / *kritieke waardes*
- ✓  $-1 < x < 4$ , but/maar  $x \in \mathbb{N}$
- ✓  $\therefore x \in \{1; 2; 3\}$  (3)

1.2	1.2.1	$\frac{14}{p} = p + 5$ $p(p+5) = 14$ $p^2 + 5p - 14 = 0$ $(p+7)(p-2) = 0$ $p = -7 \text{ or / of } p = 2$	<ul style="list-style-type: none"> <li>✓ multiplying by LCD <i>vermenigvuldig met KGD</i></li> <li>✓ factors / <i>faktore</i></li> <li>✓ answer / <i>antwoord</i></li> </ul>	(3)
	1.2.2	$\frac{14}{\sqrt{x+5}} = \sqrt{x+5} + 5$ <p>Let/Laat <math>\sqrt{x+5} = p</math></p> $2 = \sqrt{x+5} \text{ or / of } -7 = \sqrt{x+5}$ <p>But/Maar <math>-7 \neq \sqrt{x+5}</math></p> $x+5 = (2)^2$ $x = 4 - 5$ $x = -1$	<ul style="list-style-type: none"> <li>✓ <math>2 = \sqrt{x+5}</math> or / of <math>-7 = \sqrt{x+5}</math></li> <li>✓ <math>-7 \neq \sqrt{x+5}</math></li> <li>✓ square both sides / <i>kwadreer beide kante</i></li> <li>✓ x-value/x-waarde</li> </ul>	(4)
1.3		$-3y = 1 - x \dots\dots\dots(1)$ $x^2 - 2xy - y^2 - 7 = 0 \dots\dots(2)$ <p>From / Vanaf (1): <math>x = 1 + 3y \dots\dots\dots(3)</math></p> <p>(3) into/in (2):</p> $(1+3y)^2 - 2y(1+3y) - y^2 - 7 = 0$ $1 + 6y + 9y^2 - 2y - 6y^2 - y^2 - 7 = 0$ $2y^2 - 4y - 6 = 0$ $y^2 - 2y - 3 = 0$ $(y-3)(y+1) = 0$ $y = 3 \text{ or/of } y = -1$ $x = 10 \text{ or/of } x = -2$	<ul style="list-style-type: none"> <li>✓ <math>x = 1 + 3y</math></li> <li>✓ substitution / <i>vervanging</i></li> <li>✓ standard form / <i>standaardvorm</i></li> <li>✓ factors / <i>faktore</i></li> <li>✓ y-values / <i>y-waardes</i></li> <li>✓ x-values / <i>x-waardes</i></li> </ul>	(6)

1.4	$\frac{2}{x} + \frac{1}{x^2} = 3$ $2x + 1 - 3x^2 = 0$ $3x^2 - 2x - 1 = 0$ $(3x + 1)(x - 1) = 0$ $x = -\frac{1}{3} \text{ or / of } x = 1 \text{ but / maar } x < 0$ $\therefore x = -\frac{1}{3}$ $2(6x - 1)^{-1}$ $= \frac{2}{6x - 1}$ $= \frac{2}{6\left(-\frac{1}{3}\right) - 1}$ $= \frac{2}{-2 - 1}$ $= -\frac{2}{3}$	<p>✓ multiplying by LCD <i>vermenigvuldig met KGD</i></p> <p>✓ x-value / x-waarde</p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ answer / <i>antwoord</i></p>
		(4) <b>[26]</b>

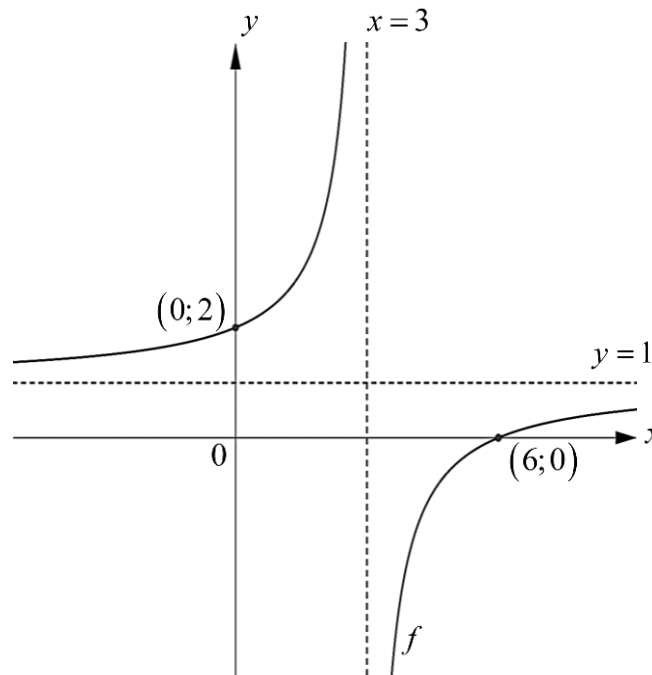
QUESTION 2/VRAAG 2		
2.1	$\frac{\sqrt{32} - \sqrt{18} + 3\sqrt{3}}{\sqrt{108} + \sqrt{8}}$ $= \frac{\sqrt{16 \times 2} - \sqrt{9 \times 2} + 3\sqrt{3}}{\sqrt{36 \times 3} + \sqrt{4 \times 2}}$ $= \frac{4\sqrt{2} - 3\sqrt{2} + 3\sqrt{3}}{6\sqrt{3} + 2\sqrt{2}}$ $= \frac{3\sqrt{3} + \sqrt{2}}{6\sqrt{3} + 2\sqrt{2}}$ $= \frac{3\sqrt{3} + \sqrt{2}}{2(3\sqrt{3} + \sqrt{2})}$ $= \frac{1}{2}$	<p>✓ factors of 32 , 18 , 108 and 8 (square number and prime factor) <i>faktore van 32, 18, 108 en 8</i> (vierkantgetal en priemgetal)</p> <p>✓ <math>\frac{4\sqrt{2} - 3\sqrt{2} + 3\sqrt{3}}{6\sqrt{3} + 2\sqrt{2}}</math></p> <p>✓ <math>\frac{3\sqrt{3} + \sqrt{2}}{2(3\sqrt{3} + \sqrt{2})}</math></p> <p>✓ answer / <i>antwoord</i> (4)</p>
2.2	2.2.1 $2x^{\frac{-5}{2}} = 64$ $x^{\frac{-5}{2}} = 32$ $x = (2^5)^{\frac{2}{-5}}$ $x = 2^{-2}$ $x = \frac{1}{2^2}$ $x = \frac{1}{4}$	<p>✓ dividing by 2 / <i>deel deur 2</i></p> <p>✓ raising by the reciprocal of <math>-\frac{5}{2}</math> <i>tot die mag van omgekeerde van <math>-\frac{5}{2}</math></i></p> <p>✓ answer / <i>Antwoord</i> (3)</p>
	2.2.2 $3 \cdot 5^x - 5^{x-1} = 14$ $3 \cdot 5^x - 5^x \cdot 5^{-1} = 14$ $5^x \left( 3 - \frac{1}{5} \right) = 14$ $5^x \cdot \frac{14}{5} = 14$ $5^x = 14 \times \frac{5}{14}$ $5^x = 5$ $\therefore x = 1$	<p>✓ reversing the law / <i>die omkeer van die wet <math>a^m \times a^n = a^{m+n}</math></i> application of / <i>toepassing van <math>a^{m+n} = a^m \times a^n</math></i></p> <p>✓ common factor / <i>gemene faktor</i></p> <p>✓ simplification / <i>vereenvoudiging</i></p> <p>✓ <math>5^x = 5</math></p> <p>✓ answer / <i>antwoord</i> (5)</p>

<p>2.3</p>	$\sqrt{a} + \sqrt{b} = \sqrt{9 + \sqrt{56}}$ $(\sqrt{a} + \sqrt{b})^2 = (\sqrt{9 + \sqrt{56}})^2$ $a + b + 2\sqrt{ab} = 9 + \sqrt{2 \times 14}$ $a + b + 2\sqrt{ab} = 9 + 2\sqrt{14}$ <p>but / maar, <math>\sqrt{56} = 2\sqrt{14}</math></p> $\therefore a + b = 9 \text{ and / en } 2\sqrt{ab} = 2\sqrt{14} \Rightarrow ab = 14$ <p>by inspection / deur inspeksie:</p> $a = 2 \text{ or / of } b = 7$ $\therefore a^2 + b^2 = (2)^2 + (7)^2$ $= 53$ <p style="text-align: center;"><b>OR/OF</b></p> $\sqrt{a} + \sqrt{b} = \sqrt{9 + \sqrt{56}}$ $(\sqrt{a} + \sqrt{b})^2 = (\sqrt{9 + \sqrt{56}})^2$ $a + b + 2\sqrt{ab} = 9 + \sqrt{2 \times 14}$ $a + b + 2\sqrt{ab} = 9 + 2\sqrt{14}$ <p>but / maar, <math>\sqrt{56} = 2\sqrt{14}</math></p> $\therefore a + b = 9 \text{ and / en } 2\sqrt{ab} = 2\sqrt{14} \Rightarrow ab = 14$ $a = 9 - b \dots \dots \dots (1)$ $ab = 14 \dots \dots \dots (2)$ $b(9 - b) = 14$ $9b - b^2 - 14 = 0$ $b^2 - 9b + 14 = 0$ $(b - 2)(b - 7) = 0$ $b = 2 \text{ or / of } b = 7$ <p>for / vir <math>b = 2 : a = 7</math></p> <p>for / vir <math>b = 7 : a = 2</math></p> $\therefore a^2 + b^2 = 53$	<p>✓ squaring both sides kwadreer albei kante</p> <p>✓ <math>\sqrt{56} = 2\sqrt{14}</math></p> <p>✓ <math>a + b = 9</math> and/en <math>2\sqrt{ab} = 2\sqrt{14}</math></p> <p>✓ <math>a = 2</math> or / of <math>b = 7</math></p> <p>✓ <math>a^2 + b^2 = 53</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>✓ squaring both sides kwadreer albei kante</p> <p>✓ <math>\sqrt{56} = 2\sqrt{14}</math></p> <p>✓ <math>a + b = 9</math> and/en <math>2\sqrt{ab} = 2\sqrt{14}</math></p> <p>✓ <math>a = 2</math> or / of <math>b = 7</math></p> <p>✓ <math>a^2 + b^2 = 53</math></p> <p style="text-align: right;">(5)</p> <p style="text-align: right;"><b>[17]</b></p>
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QUESTION 3/VRAAG 3			
3.1	3.1.1	-5; -9; -13; ... -17; -21	✓ -17 ✓ -21 (2)
	3.1.2	$T_n = dn + c$ $d = -4$ $T_n = -4n + c$ Subst. / Verv. ( $T_1 = -5$ ) $-5 = -4(1) + c$ $\therefore c = -1$ $T_n = -4n - 1$	✓ $d = -4$ ✓ $c = -1$ (2)
	3.1.3	$-141 = -4n - 1$ $-140 = -4n$ $\therefore n = 35$	✓ equating / gelykstel ✓ value of $n$ / waarde van $n$ (2)
3.2		$T_1 = x$ $d = x - 5$ Sequence / Ry : $x; x + (x - 5); x + 2(x - 5)$ Equation / Vergelyking : $x + x + (x - 5) + x + 2(x - 5) = 63$ $4x - 5 + 2x - 10 = 63$ $6x = 78$ $x = 13$	✓ $x - 5$ ✓ $T_2$ & $T_3$ ✓ equating to 63 / stel gelyk aan 63 ✓ simplification / vereenvoudiging ✓ value of $x$ / waarde van $x$ (5)
			[11]

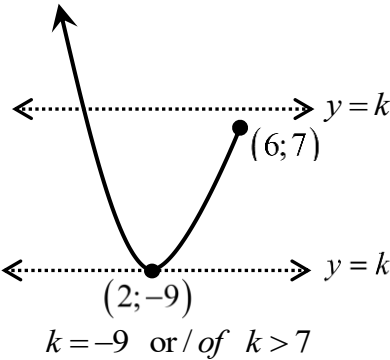


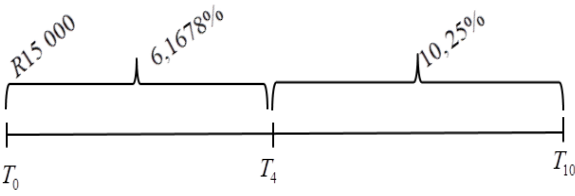
QUESTION 4/VRAAG 4		
4.1	$24 \quad ; \quad 10 \quad ; \quad 0 \quad ; \quad -6$ $-14 \quad ; \quad -10 \quad ; \quad -6$ $4 \quad ; \quad 4$	✓ first difference / <i>eerste verskil</i> ✓ second difference / <i>tweede verskil</i> (2)
4.2	$2a = 4 \quad 3(2) + b = -14 \quad a + b + c = 24$ $a = 2 \quad b = -14 - 3(2) \quad c = 24 - 2 + 20$ $b = -20 \quad c = 42$ $T_n = 2n^2 - 20n + 42$	✓ $a = 6$ ✓ $b = -9$ ✓ $c = 6$ ✓ $T_n = 2n^2 - 20n + 42$ (4)
4.3	$T_{52} = 2(52)^2 - 20(52) + 42$ $= 4410$	✓ substitution / <i>vervanging</i> ✓ answer / <i>antwoord</i> (2)
4.4	$T_n = 2n^2 - 20n + 42$ $n = \frac{-b}{2a}$ $n = \frac{-(-20)}{2(2)} = 5$ $T_5 = 2(5)^2 - 20(5) + 42$ $= -8$ <p>Therefore, the smallest value of the sequence is <math>-8</math>  <i>Daarom is die kleinste waarde van die ry <math>-8</math></i></p> <p style="text-align: center;"><b>OR / OF</b></p> $T_n = 2n^2 - 20n + 42$ $T_n = 2(n^2 - 10n + 21)$ $T_n = 2(n^2 - 10n + (-5)^2 - (-5)^2 + 21)$ $T_n = 2((n-5)^2 - 4)$ $T_n = 2(n-5)^2 - 8$ <p>Therefore, the smallest value of the sequence is <math>-8</math>  <i>Daarom is die kleinste waarde van die ry <math>-8</math></i></p>	✓ value of $n$ / <i>waarde van <math>n</math></i> ✓ substitution / <i>vervanging</i> ✓ answer / <i>antwoord</i> ✓ common factor <i>gemene faktor</i> ✓ completing the square <i>voltooiing van die vierkant</i> ✓ answer / <i>antwoord</i> (3)
4.5	$T_n = 2n^2 - 20n + 42$ $2n^2 - 20n + 42 > 0$ $n^2 - 10n + 21 > 0$ $(n-7)(n-3) > 0$ $c. v's\{3; 7\}$ $\therefore 1 \leq n < 3 \text{ or/ of } n > 7, n \in \mathbb{N}$ <p>Accept/Aanvaar:  <math>1 \leq n \leq 3 \text{ or } n \geq 7, n \in \mathbb{N}</math></p>	✓ $T_n > 0$ ✓ factors / <i>faktore</i> ✓ $1 \leq n < 3$ or / of $n > 7$ ✓ $n \in \mathbb{N}$ (4)
<b>[15]</b>		

QUESTION 5/VRAAG 5		
5.1	$x - 2 = -x + 4$ $2x = 6$ $x = 3$ $x - 3 = 0$ $\therefore p = -3$ $y = x - 2$ $= (3) - 2$ $= 1$ $\therefore q = 1$	$\checkmark$ equating / <i>gelyk stel</i>  $\checkmark x - 3 = 0$  $\checkmark$ substituting $x$ / <i>vervang <math>x</math></i> $\checkmark y = 1$ (4)
5.2	$x - \text{int} / x - \text{afsnit}: (y = 0)$ $\frac{-3}{x-3} + 1 = 0$ $\frac{-3}{x-3} = -1$ $-x + 3 = -3$ $x = 6$	$\checkmark$ Letting / <i>Laat <math>y = 0</math></i>   $\checkmark x = 6$ (2)
5.3	$y - \text{int} / y - \text{afsnit}: (x = 0)$ $y = \frac{-3}{0-3} + 1$ $y = 2$	$\checkmark$ Letting / <i>Laat <math>x = 0</math></i>  $\checkmark y = 2$ (2)
5.4		$\checkmark$ shape / <i>vorm</i> $\checkmark$ asymptotes / <i>asimptote</i> $\checkmark$ intercepts / <i>afsnitte</i> (3)

5.5	<p>Vertical asymptote of <math>g</math> (by inspection) : <math>x = -3</math>  <i>Vertikale asimptoot van <math>g</math> (deur inspeksie)</i>  <math>\therefore x \in \mathbb{R}; x \neq -3</math></p> <p style="text-align: center;"><b>OR/OF</b></p> $f(x) = \frac{-3}{x-3} + 1$ <p><math>x = 0 \Rightarrow y\text{-axis / } y\text{-as}</math></p> $g(x) = f(-x) = \frac{-3}{-x-3} + 1$ $-x - 3 = 0$ $x = -3$ $\therefore x \in \mathbb{R}; x \neq -3$	<p>✓ vertical asymptote  <i>vertikale asimptoot</i>          ✓✓ <math>x \in \mathbb{R}; x \neq -3</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>✓ vertical asymptote  <i>vertikale asimptoot</i>          ✓✓ <math>x \in \mathbb{R}; x \neq -3</math> (3)</p>
5.6	$x \leq 0$ or / of $3 < x \leq 6$	<p>✓ <math>x \leq 0</math>          ✓✓ <math>3 &lt; x \leq 6</math> (3)</p>
		<b>[17]</b>

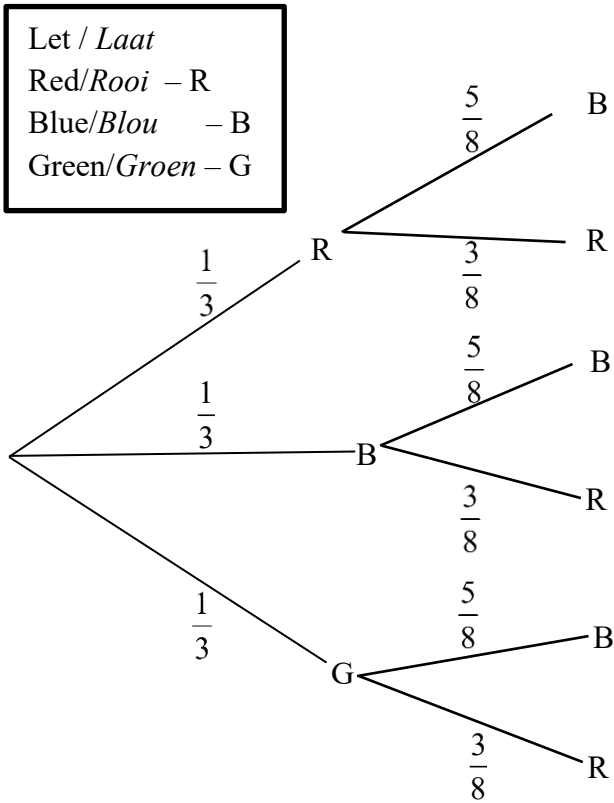
QUESTION 6/VRAAG 6		
6.1	$f(x) = x^2 - 4x - 5$ $f(6) = (6)^2 - 4(6) - 5$ $= 7$	✓ answer / antwoord (1)
6.2	$x^2 - 4x - 5 = 0$ $(x - 5)(x + 1) = 0$ $x = 5 \text{ or / of } x = -1$ $\therefore A(-1; 0) \quad B(5; 0)$	✓ factors / faktore ✓ coordinates of A / koördinate van A ✓ coordinates of B / koördinate van B (3)
6.3	$AB = x_B - x_A$ $= 5 - (-1) = 6 \text{ units / eenhede}$	✓ answer / antwoord (1)
6.4	$g(x) = (x - 2)^2 - 4(x - 2) - 5 + 5$ $= x^2 - 4x + 4 - 4x + 8 - 5 + 5$ $= x^2 - 8x - 12$	✓ $(x - 2)$ ✓ +5 ✓ answer / antwoord (3)
6.5	$h(x) = -2x + c$ $f(x) = x^2 - 4x - 5$ $x^2 - 4x - 5 = -2x + c$ $x^2 - 2x - 5 - c = 0$ $\Delta = b^2 - 4ac$ $= (-2)^2 - 4(1)(-5 - c)$ $= 4 - 4(-5 - c)$ $= 4 + 20 + 4c$ $= 24 + 4c$ <p>Tangent <math>\Rightarrow</math> one solution / Raaklyn <math>\Rightarrow</math> een oplossing</p> $\therefore \Delta = 0$ $24 + 4c = 0$ $4c = -24$ $c = -6$ <p>Therefore, y-int = -6 / Daarom, y-afsnit = -6</p>	✓ $f(x) = g(x)$ ✓ simplification / vereenvoudiging  ✓ $\Delta = 24 + 4c$  ✓ $\Delta = 0$  ✓ $c = -6$ (5)

<p>6.6</p>	$f(x) = k$ $x = \frac{-b}{2a}$ $= -\frac{-(-4)}{2(1)}$ $= 2$ $f(2) = -9$  <p><math>k = -9</math> or / of <math>k &gt; 7</math></p>	<p>✓ <math>f(2) = -9</math></p> <p>✓✓ <math>k = -9</math> or / of <math>k &gt; 7</math></p> <p style="text-align: right;">(3)</p>
<b>[16]</b>		
<b>QUESTION 7/VRAAG 7</b>		
<p>7.1</p>	<p>B(0;7)</p>	<p>✓ answer / antwoord (1)</p>
<p>7.2</p>	$f(x) = -b^x + 8$ <p>subst. / verv.: (-2;4)</p> $4 = -b^{-2} + 8$ $b^{-2} = 4$ $\frac{1}{b^2} = 4$ $b^2 = \frac{1}{4}$ $b = \pm\sqrt{\frac{1}{4}}$ $\therefore b = \frac{1}{2} ; b > 0$	<p>✓ substitution of (-2;4) vervanging van (-2;4)</p> $\checkmark b = \pm\sqrt{\frac{1}{4}}$ <p style="text-align: right;">(2)</p>
<p>7.3</p>	<p>Average gradient / Gemiddelde gradiënt = <math>\frac{3}{2}</math></p>	<p>✓✓ <math>\frac{3}{2}</math></p> <p style="text-align: right;">(2)</p>
<p>7.4</p>	<p><math>y = 8</math></p>	<p>✓ answer / antwoord (1)</p>

7.5	$f(-1) = -\left(\frac{1}{2}\right)^{-1} + 8 = 6$ $g(-1) = \frac{3}{2}(-1) + 7 = \frac{11}{2}$ $f(-1) - g(-1) = 6 - \frac{11}{2}$ $= \frac{1}{2} \text{ unit/eenheid}$	<ul style="list-style-type: none"> <li>✓ <math>f(-1) = 6</math></li> <li>✓ <math>g(-1) = \frac{11}{2}</math></li> <li>✓ <math>f(-1) - g(-1) = \frac{1}{2}</math></li> </ul>	(3)
7.6	<p>- Reflection along <math>x</math>-axis / <i>Refleksie langs die <math>x</math>-as</i></p> $-f(x) = \left(\frac{1}{2}\right)^x - 8$ <p>- then, vertical translation by 3 units upwards <i>dan, vertikale translasie van 3 eenhede opwaarts</i></p> $h(x) = \left(\frac{1}{2}\right)^x - 8 + 3$ $= \left(\frac{1}{2}\right)^x - 5$	<ul style="list-style-type: none"> <li>✓ Reflection along <math>x</math>-axis <i>Refleksie langs die <math>x</math>-as</i></li> <li>✓ 3 units upwards <i>3 eenhede opwaarts</i></li> </ul>	(2)
7.7	$-2 \leq x \leq 0$ or / of $x \in [-2; 0]$	✓✓ answer / antwoord	(2)
			<b>[13]</b>
<b>QUESTION 8/VRAAG 8</b>			
8.1	$A = P(1-i)^n$ $= 14\,500(1-0,13)^5$ $= R7\,227,10$	<ul style="list-style-type: none"> <li>✓ <math>i = 0,13</math></li> <li>✓ substitution into the correct formula <i>vervanging in die korrekte formule</i></li> <li>✓ answer / antwoord</li> </ul>	(3)
8.2	8.2.1 $i_{\text{eff}} = \left(1 + \frac{0,06}{12}\right)^{12} - 1$ $= 6,1678\%$ $i_{\text{eff}} = \left(1 + \frac{0,1}{2}\right)^2 - 1$ $= 10,25\%$	<ul style="list-style-type: none"> <li>✓ <math>i_{\text{eff}} = \left(1 + \frac{0,06}{12}\right)^{12} - 1</math></li> <li>✓ 6,1678%</li> <li>✓ <math>i_{\text{eff}} = \left(1 + \frac{0,1}{2}\right)^2 - 1</math></li> <li>✓ 10,25%</li> </ul>	(4)
	8.2.2  $A = 15\,000 \left(1 + \frac{6,1678}{100}\right)^4 (1 + 0,1025)^6$ $= R34\,224,26$	<ul style="list-style-type: none"> <li>✓ <math>15\,000 \left(1 + \frac{6,1678}{100}\right)^4</math></li> <li>✓ <math>\times (1 + 0,1025)^6</math></li> <li>✓ <math>n = 4</math> and / en <math>n = 6</math></li> <li>✓ answer / antwoord</li> </ul>	(4)

	8.2.3	$15\,000\left(1+\frac{0,06}{12}\right)^{48}\left(1+\frac{x}{4}\right)^8\left(1+\frac{x}{2}\right)^8 = 48\,897,03$ $\left[\left(1+\frac{x}{4}\right)\left(1+\frac{x}{2}\right)\right]^8 = 2,565784627$ $1+\frac{x}{2}+\frac{x}{4}+\frac{x^2}{8} = 1,125$ $8+4x+2x+x^2 = 9$ $x^2+6x-1 = 0$ $x = \frac{-6 \pm \sqrt{(6)^2 - 4(1)(-1)}}{2(1)}$ $x = 0,1623 \text{ or/of } x = -6,1623$ $\therefore \text{Interest rate/Rentekoers} = 16,23\%$	<p>✓</p> $15000\left(1+\frac{6\%}{12}\right)^{48}\left(1+\frac{x}{4}\right)^8\left(1+\frac{x}{2}\right)^8 = 48897,03$ <p>✓ <math>\left[\left(1+\frac{x}{4}\right)\left(1+\frac{x}{2}\right)\right]^8 = 2,565784627</math></p> <p>✓ multiplying by the LCD / <i>vermenigvuldig met KGD</i></p> <p>✓ standard form / <i>standaardvorm</i></p> <p>✓ answer / <i>antwoord</i> (5)</p>
		<b>[16]</b>	
<b>QUESTION 9/VRAAG 9</b>			
9.1	9.1.1	<p>At least detected by one camera <math>\Rightarrow A</math> or <math>B</math>  <i>Ten minste deur een kamera opgespoor</i>  <math>\Rightarrow A</math> of <math>B</math></p> $P(A \text{ or / of } B) = P(A) + P(B) - P(A \text{ and / en } B)$ $= 0,5 + 0,6 - (0,5 \times 0,6)$ $= 0,8$	<p>✓ <math>0,5 \times 0,6</math></p> <p>✓ substitution into the correct formula  <i>vervanging in die korrekte formule</i></p> <p>✓ answer / <i>antwoord</i> (3)</p>
	9.1.2	<p><math>P(\text{Not detected}) = 1 - (\text{at least detected by one})</math>  <i>P(Nie opgespoor) = 1 - (ten minste deur een opgespoor)</i></p> $= 1 - 0,8$ $= 0,2$	<p>✓ <math>1 - 0,8</math></p> <p>✓ answer / <i>antwoord</i> (2)</p>
9.2	9.2.1	$x = 110 - (26 + 9 + 12 + 4 + 24 + 15 + 12)$ $= 8$	<p>✓✓ <math>110 - (26 + 9 + 12 + 4 + 24 + 15 + 12)</math> (2)</p>
	9.2.2	$\frac{26 + 24 + 15}{110}$ $= \frac{65}{110} \approx 0,59$	<p>✓ 65</p> <p>✓ <math>\frac{65}{110}</math> or / of <math>\frac{13}{22}</math> or / of 0,59 (2)</p>
	9.2.3	$\frac{12}{110}$ $\frac{6}{55} \approx 0,12$	<p>✓ 12</p> <p>✓ <math>\frac{6}{55}</math> or / of 0,12 (2)</p>
		<b>[11]</b>	

QUESTION 10/VRAAG 10



$$\frac{1}{3} \times \frac{5}{8} = \frac{5}{24}$$

$$\frac{1}{3} \times \frac{3}{8} = \frac{1}{8}$$

$$\therefore \frac{5}{24} + \frac{1}{8} = \frac{1}{3}$$

$P(\text{same colour / dieselfde kleur})$   
 $= \frac{1}{3}$  or / of  $\approx 0,33$

- ✓✓ branches/takke (R ; B)
- ✓ probabilities/waarskynlikhede (R ; R)
- ✓ outcomes/uikomste (B ; B)
- (B ; R)
- (R ; B)
- (G ; R)
- ✓  $\frac{5}{24}$
- ✓  $\frac{1}{8}$
- ✓ answer / antwoord

(8)

**Alternative Marking / Alternatiewe Nasien**

- ✓  $\frac{1}{3}$
- ✓  $\frac{5}{8}$
- ✓  $\frac{5}{24}$
- ✓  $\frac{1}{3}$
- ✓  $\frac{3}{8}$
- ✓  $\frac{1}{8}$

- ✓ addition / optelling
- ✓ answer / antwoord

[8]

**TOTAL / TOTAAL: 150**