



Province of the  
**EASTERN CAPE**  
EDUCATION



**NATIONAL  
SENIOR CERTIFICATE/  
NASIONALE  
SENIOR SERTIFIKAAT**

**GRADE/GRAAD 11**

**NOVEMBER 2022**

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

**MARKS/PUNTE: 150**

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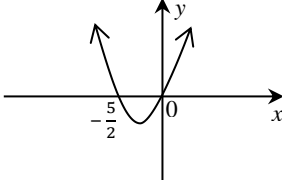
This marking guideline consists of 18 pages./  
*Hierdie nasienriglyn bestaan uit 18 bladsye.*

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**NOTE/LET WEL:**

- If a candidate answers a question TWICE, mark the FIRST attempt ONLY.  
*Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk SLEGS die EERSTE poging.*
- Consistent accuracy 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 substitusie word toegeken vir substitusie in die korrekte formule.*

**QUESTION 1/VRAAG 1**

1.1.1	$x^2 + 5x - 6 = 0$ $(x + 6)(x - 1) = 0$ $\therefore x = -6$ or / of $x = 1$	✓ factors / faktore ✓ ✓ answers / antwoorde (3)
1.1.2	$5x^2 + x - 3 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-1 \pm \sqrt{1^2 - 4(5)(-3)}}{2(5)}$ $= \frac{-1 \pm \sqrt{61}}{10}$ $= 0,68$ or / of $-0,88$	✓ substitution / vervanging ✓ ✓ answers / antwoorde (3)
1.1.3	$(2x - 1)(x + 3) \geq -3$ $2x^2 + 5x - 3 \geq -3$ $2x^2 + 5x \geq 0$ $x(2x + 5) \geq 0$ $\therefore x \leq -\frac{5}{2}$ or / of $x \geq 0$	 ✓ $2x^2 + 5x - 3$ ✓ standard form / standaardvorm ✓ factors / faktore ✓ ✓ answers / antwoorde (5)

<p>1.1.4</p>	$\sqrt{x} - \sqrt{x-5} = 1$ $\sqrt{x} - 1 = \sqrt{x-5}$ $(\sqrt{x} - 1)^2 = (\sqrt{x-5})^2$ $x - 2\sqrt{x} + 1 = x - 5$ $6 = 2\sqrt{x}$ $(6)^2 = (2\sqrt{x})^2$ $\therefore 4x = 36$ $x = 9$	<p>✓ <math>\sqrt{x} - 1 = \sqrt{x-5}</math></p> <p>✓ squaring both sides <i>kwadreer beide kante</i></p> <p>✓ <math>x - 5 = x - 2\sqrt{x} + 1</math></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(4)</p>
<p>1.2</p>	$2x - y = 1 \quad (1)$ $y^2 - xy = x + 7 \quad (2)$ $y = 2x - 1 \quad (3)$ <p>Subst.(3) into 2 / <i>Verv.(3) in (2)</i></p> $(2x - 1)^2 - x(2x - 1) = x + 7$ $4x^2 - 4x + 1 - 2x^2 + x - x - 7 = 0$ $2x^2 - 4x - 6 = 0$ $x^2 - 2x - 3 = 0$ $(x - 3)(x + 1) = 0$ <p><math>\therefore x = 3</math> or / <i>of</i> <math>x = -1</math></p> <p><math>y = 2(3) - 1</math> or / <i>of</i> <math>y = 2(-1) - 1</math></p> <p><math>\therefore y = 5</math> or / <i>of</i> <math>y = -3</math></p> <p style="text-align: center;"><b>OR/OF</b></p> $2x - y = 1 \quad (1)$ $y^2 - xy = x + 7 \quad (2)$ $x = \frac{1+y}{2} \quad (3)$ <p>Subst.(3) into 2 / <i>Verv.(3) in (2)</i></p> $y^2 - y\left(\frac{1+y}{2}\right) = \left(\frac{1+y}{2}\right) + 7$ $2y^2 - y(1+y) = (1+y) + 14$ $2y^2 - y - y^2 = 1 + y + 14$ $y^2 - 2y - 15 = 0$ $(y - 5)(y + 3) = 0$ <p><math>\therefore y = 5</math> or / <i>of</i> <math>y = -3</math></p> <p><math>x = \frac{1+5}{2}</math> or / <i>of</i> <math>x = \frac{1-3}{2}</math></p> <p><math>\therefore x = 3</math> or / <i>of</i> <math>x = -1</math></p>	<p>✓ <math>y = 2x - 1</math></p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ standard form / <i>standaardvorm</i></p> <p>✓ factors / <i>faktore</i></p> <p>✓ both x-values / <i>beide x-waardes</i></p> <p>✓ both y-values / <i>beide y-waardes</i></p> <p>✓ <math>x = \frac{1+y}{2}</math></p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ standard form / <i>standaardvorm</i></p> <p>✓ factors / <i>faktore</i></p> <p>✓ both y-values / <i>beide y-waardes</i></p> <p>✓ both x-values / <i>beide x-waardes</i></p> <p style="text-align: right;">(6)</p>

1.3	<p><math>\hat{C} = 90^\circ</math> (angle in a semi-circle) (hoek in halwe sirkel)</p> <p><math>\therefore</math> By Pythagoras's Theorem <i>Stelling van Pythagoras:</i></p> $AB^2 = AC^2 + BC^2$ $= (x+3)^2 + (5-x)^2$ $= x^2 + 6x + 9 + 25 - 10x + x^2$ $= 2x^2 - 4x + 34$ $= 2(x^2 - 2x + 17)$ $= 2(x^2 - 2x + 1 - 1 + 17)$ $= 2(x-1)^2 + 32$ <p><math>\therefore x = 1</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>AB is minimum when <math>AB^2</math> is minimum</p> $AB^2 = (x+3)^2 + (5-x)^2$ $= x^2 + 6x + 9 + 25 - 10x + x^2$ $= 2x^2 - 4x + 34$ <p><math>AB^2</math> is minimum at / <math>AB^2</math> is 'n minimum by:</p> $x = -\frac{b}{2a}$ $= \frac{-(-4)}{2(2)}$ $= 1$	<p>✓ <math>\hat{C} = 90^\circ</math></p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ <math>2x^2 - 4x + 34</math></p> <p>✓ completing the square <i>vierkantsvoltooiing</i></p> <p>✓ answer / <i>antwoord</i></p> <p>✓ statement / <i>stelling</i></p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ <math>2x^2 - 4x + 34</math></p> <p>✓ <math>x = -\frac{b}{2a}</math></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(5)</p>
		<b>[26]</b>

QUESTION 2/VRAAG 2

<p>2.1</p>	$\frac{2^{2x} - 4^{x+1}}{4^x + 2^{2x-1}}$ $= \frac{2^{2x} - 2^{2x+2}}{2^{2x} + 2^{2x-1}}$ $= \frac{2^{2x} - 2^{2x} \cdot 2^2}{2^{2x} + 2^{2x} \cdot 2^{-1}}$ $= \frac{2^{2x}(1 - 2^2)}{2^{2x}(1 + 2^{-1})} \text{ or / of } \frac{2^{2x}(1 - 4)}{2^{2x}(1 + \frac{1}{2})}$ $= \frac{-3}{\frac{3}{2}}$ $= -2$	<p>✓ <math>2^{2x+2}</math> and/en <math>2^{2x}</math></p> <p>✓ inverse of exp. law <i>omgekeerde van eksp. wet</i></p> <p>✓ factorisation of numerator <i>faktorisering van teller</i></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(4)</p>
<p>2.2.1</p>	$3x^{\frac{3}{2}} = 81$ $x^{\frac{3}{2}} = 27$ $\left(x^{\frac{3}{2}}\right)^{\frac{2}{3}} = (27)^{\frac{2}{3}}$ $\therefore x = 9$	<p>✓ <math>x^{\frac{3}{2}} = 27</math></p> <p>✓ <math>\left(x^{\frac{3}{2}}\right)^{\frac{2}{3}} = (27)^{\frac{2}{3}}</math></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(3)</p>
<p>2.2.2</p>	$2^x + 5 = 3 \cdot 2^{1-x}$ $2^x + 5 = 3 \cdot 2 \cdot 2^{-x}$ $2^x + 5 = \frac{3 \cdot 2}{2^x}$ $(2^x)^2 + 5 \cdot 2^x - 6 = 0$ $(2^x + 6)(2^x - 1) = 0$ $\therefore 2^x \neq -6 \text{ or / of } 2^x = 1$ $2^x = 2^0$ $\therefore x = 0$	<p>✓ inverse of exp. law <i>omgekeerde van eksp. wet</i></p> <p>✓ multiplying by <math>2^x</math> <i>maal met <math>2^x</math></i></p> <p>✓ factors / <i>faktore</i></p> <p>✓ both answers/<i>beide antwoorde</i></p> <p>✓ selection / <i>keuse</i></p> <p style="text-align: right;">(5)</p>

2.3	$\frac{1+\sqrt{2}}{3+2\sqrt{2}}$ $= \frac{(1+\sqrt{2})(3-2\sqrt{2})}{(3+2\sqrt{2})(3-2\sqrt{2})}$ $= \frac{3-2\sqrt{2}+3\sqrt{2}-2.2}{3^2-(2\sqrt{2})^2}$ $= \frac{\sqrt{2}-1}{9-8}$ $= \sqrt{2}-1$ $\therefore a=2, \quad b=-1$	<p>✓ rationalising the denominator <i>rasionalisering van die noemer</i></p> <p>✓ simplification / <i>vereenvoudiging</i></p> <p>✓ <math>\sqrt{2}-1</math> ✓ <math>a=2</math> ✓ <math>b=-1</math></p> <p style="text-align: right;">(5)</p>
		<b>[17]</b>

## QUESTION 3/VRAAG 3

3.1.1	$-2 ; 3 ; 8 ; \dots$ $T_n = 5n - 7$	$\checkmark 5n \quad \checkmark -7$  (2)
3.1.2	$T_n = 5n - 7$ $T_{18} = 5(18) - 7$ $= 83$	$\checkmark$ substitution / <i>vervanging</i> $\checkmark 83$  (2)
3.1.3	$T_n = 5n - 7$ $473 = 5n - 7$ $480 = 5n$ $\therefore n = 96$	$\checkmark$ substitution / <i>vervanging</i>  $\checkmark$ answer / <i>antwoord</i>  (2)

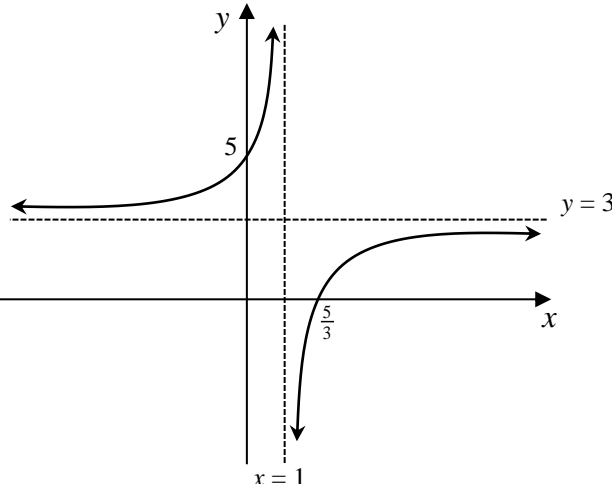
<p>3.2</p> <p><math>T_{11} = -19</math>      <math>T_{23} = 65</math></p> <p><math>-19 ; a ; b ; c ; e ; \dots ; 65</math></p> <p><math>a - (-19) = b - a = c - b = \dots = d</math></p> <p><math>\therefore</math> There are 12 common differences / <i>Daar is 12 gemeenskaplike verskille</i></p> <p><math>\therefore 12d = 65 - (-19)</math></p> <p><math>12d = 84</math></p> <p><math>\therefore d = 7</math></p> <p><math>\therefore T_n = 7n + b</math></p> <p><math>-19 = 7(11) + b</math>    or / of    <math>65 = 7(23) + b</math></p> <p><math>\therefore b = -96</math></p> <p><math>\therefore T_n = 7n - 96</math></p> <p>For negative terms : <math>T_n &lt; 0</math> <i>Vir negatiewe terme :</i></p> <p><math>\therefore 7n - 96 &lt; 0</math></p> <p><math>7n &lt; 96</math></p> <p><math>\therefore n &lt; 13,71</math></p> <p><math>\therefore</math> Number of negative terms = 13 <i>Aantal negatiewe terme</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p><math>12d = 65 - (-19)</math></p> <p><math>d = \frac{84}{12}</math></p> <p><math>= 7</math></p> <p>But / <i>Maar</i> : <math>T_1</math> to <math>T_{11}</math> are all negative / <i>almal negatief</i></p> <p><math>T_{12} = -19 + 7 = -12</math></p> <p><math>T_{13} = -12 + 7 = -5</math></p> <p><math>T_{14} = -5 + 7 = 2</math></p> <p><math>\therefore</math> There are 13 negative terms <i>Daar is 13 negatiewe terme</i></p>	<p><math>\checkmark 12d = 65 - (-19)</math></p> <p><math>\checkmark d = 7</math></p> <p><math>\checkmark T_n = 7n - 96</math></p> <p><math>\checkmark 7n - 96 &lt; 0</math></p> <p><math>\checkmark n = 13</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p><math>\checkmark 12d = 65 - (-19)</math></p> <p><math>\checkmark d = 7</math></p> <p><math>\checkmark T_1</math> to <math>T_{11}</math> are all negative / <i>is almal negatief</i></p> <p><math>\checkmark T_{12} = -12</math> &amp; <math>T_{13} = -5</math></p> <p><math>\checkmark</math> answer / <i>antwoord</i> (5)</p>	<p style="text-align: right;"><b>[11]</b></p>
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QUESTION 4/VRAAG 4

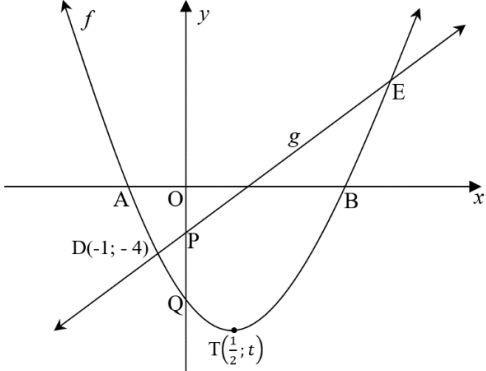
<p>4.1</p>	<p>104 ; 84</p>	<p>✓ 104 ✓ 84</p> <p>(2)</p>
<p>4.2</p>	$2a = 2 \quad 3a + b = -28 \quad a + b + c = -12$ $\therefore a = 1 \quad 3(1) + b = -28 \quad 1 - 31 + c = 204$ $b = -31 \quad c = 234$ $\therefore T_n = n^2 - 31n + 234$	<p>✓ <math>a = 1</math></p> <p>✓ <math>b = -31</math></p> <p>✓ <math>c = 234</math></p> <p>✓ <math>T_n = n^2 - 31n + 234</math></p> <p>(4)</p>
<p>4.3</p>	$n^2 - 31n + 234 = 36$ $n^2 - 31n + 198 = 0$ $n = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \text{or / of } (n-9)(n-22) = 0$ $= \frac{-(-31) \pm \sqrt{(-31)^2 - 4(1)(198)}}{2(1)}$ $= \frac{31 \pm \sqrt{169}}{2}$ $\therefore n = 9 \quad \text{or / of } n = 22$	<p>✓ <math>n^2 - 31n + 234 = 36</math></p> <p>✓ subst. into formule / factors verv. in formule / faktore</p> <p>✓ <math>n = 9</math> ✓ <math>n = 22</math></p> <p>(4)</p>
<p>4.4</p>	$n^2 - 31n + 234 = 0 \quad \text{or / of } (n-13)(n-18) = 0$ $n = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-31) \pm \sqrt{(-31)^2 - 4(1)(234)}}{2(1)}$ $= \frac{31 \pm \sqrt{25}}{2}$ $\therefore n = 13 \quad \text{or / of } n = 18$ $\therefore T_{14} \text{ \& } T_{17} = -4$ $T_{15} \text{ \& } T_{16} = -6$	<p>✓ <math>T_n = 0</math></p> <p>✓ method / metode subst. into formule / factors verv. in formule / faktore</p> <p>✓ <math>n = 13</math> and / en <math>n = 18</math></p> <p>✓ -4</p> <p>✓ -6</p> <p>(5)</p>
		<p>[15]</p>

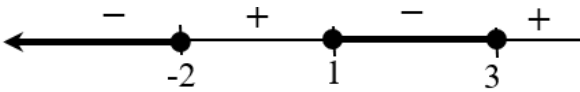
## QUESTION 5/VRAAG 5

5.1	$x = 1$ $y = 3$	$\checkmark x = 1$ $\checkmark y = 3$  (2)
5.2	$0 = \frac{-2}{x-1} + 3$ $\frac{2}{x-1} = 3$ $3(x-1) = 2$ $x = \frac{5}{3}$ $y = \frac{-2}{x-1} + 3$ $= \frac{-2}{0-1} + 3$ $= 5$ <p><math>\therefore</math> Intercepts are at / Afsnitte is by:  <math>(\frac{5}{3}; 0)</math> and / en <math>(0; 5)</math></p>	$\checkmark y = 0$  $\checkmark x = \frac{5}{3}$  $\checkmark y = 5$  (3)
5.3		$\checkmark x$ -intercept / $x$ -afsnit $\checkmark y$ -intercept / $y$ -afsnit $\checkmark$ asymptotes / $asimptote$ $\checkmark$ shape & quadrants $vorm$ & $kwadrante$  (4)
5.4	$y = -(x-1) + 3$ $= -x + 4$	$\checkmark\checkmark y = -x + 4$  (2)

<p>5.5</p>	$g(x) = -x + b$ $-2 = -(5) + b \quad \text{OR/OF} \quad y - y_1 = m(x - x_1)$ $\therefore b = 3 \quad \quad \quad y + 2 = -1(x - 5)$ $g(x) = -x + 3 \quad \quad \quad \therefore y = g(x) = -x + 3$	<p>✓ <math>a = -1</math>                  ✓ substitution / <i>vervanging</i>                  ✓ <math>b = 3</math></p> <p>(3)</p>
<p>5.6</p>	$f(x) = g(x)$ $\frac{-2}{x-1} + 3 = -x + 3$ $\frac{-2}{x-1} = -x$ $-x(x-1) = -2$ $-x^2 + x + 2 = 0$ $x^2 - x - 2 = 0$ $(x+1)(x-2) = 0$ $\therefore x = -1 \text{ or / of } x = 2$ $\therefore y = -(-1) + 3 \text{ or / of } y = -(2) + 3$ $= 4 \quad \quad \quad = 1$ <p>Points of intersection / <i>Sny punte by</i> :                  (-1;4) and / <i>en</i> (2;1)</p> $\therefore d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(2 - (-1))^2 + (1 - 4)^2}$ $= \sqrt{18} = 3\sqrt{2}$	<p>✓ equating/<i>gelykstel</i>:  <math>f(x) = g(x)</math></p> <p>✓ standard form / <i>standaardvorm</i></p> <p>✓ both sets of coordinates  <i>beide pare van koördinate</i></p> <p>✓ substitution into correct formula / <i>vervanging in die korrekte formule</i></p> <p>✓ answer / <i>antwoord</i></p> <p>(5)</p>
<p>5.7</p>	$h(x) = -f(x+3)$ $= \frac{2}{(x+3)-1} - 3$ $= \frac{2}{x+2} - 3$	<p>✓ <math>a = +2</math> &amp; <math>q = -3</math>                  (reflection/<i>refleksie</i>)</p> <p>✓ <math>x + 2</math></p> <p>(2)</p>
		<p>[21]</p>

QUESTION 6/VRAAG 6

		
<p>6.1</p>	<p><math>f(x) = ax^2 + bx + c</math>  P is at/by: <math>(0; -2)</math>  Q is at/by: <math>(0; -6)</math>  <math>\therefore f(x) = ax^2 + bx - 6</math>  <math>-4 = (-1)^2 a + (-1)b - 6</math>  <math>2 = a - b \dots \dots \dots (1)</math>  At TP/By DP: <math>x = \frac{-b}{2a}</math>  <math>\frac{1}{2} = \frac{-b}{2a}</math>  <math>\therefore 2a = -2b</math>  <math>a = -b \dots \dots \dots (2)</math>  <math>\therefore 2 = -b - b</math>  <math>2 = -2b</math>  <math>b = -1</math>  <math>\therefore a = -(-1)</math>  <math>= 1</math></p>	<p><math>\checkmark c = -6</math>  <math>\checkmark a - b = 2</math>  <math>\checkmark</math> substitute for <math>x</math> / <i>vervang vir <math>x</math></i>  <math>\checkmark a = -b</math>  <math>\checkmark</math> values of <math>a</math> and <math>b</math>.  <i>waardes van <math>a</math> en <math>b</math></i></p> <p style="text-align: right;">(5)</p>
<p>6.2</p>	<p><math>f(x) = x^2 - x - 6</math>  <math>= x^2 - x + \frac{1}{4} - \frac{1}{4} - 6</math>  <math>= (x - \frac{1}{2})^2 - 6\frac{1}{4}</math>  <math>t = -6\frac{1}{4}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p><math>f(x) = x^2 - x - 6</math>  <math>\therefore y = (\frac{1}{2})^2 - (\frac{1}{2}) - 6</math>  <math>= -6\frac{1}{4}</math>  <math>\therefore t = -6\frac{1}{4}</math></p>	<p><math>\checkmark</math> completing the square  <i>vierkantsvoltooiing</i>  <math>\checkmark</math> factorisation / <i>faktorisering</i>  <math>\checkmark t = -6\frac{1}{4}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p><math>\checkmark f(\frac{1}{2})</math>  <math>\checkmark y = -6\frac{1}{4}</math>  <math>\checkmark t = -6\frac{1}{4}</math></p> <p style="text-align: right;">(3)</p>

<p>6.3</p>	$f(x) = x^2 - x - 6$ $0 = (x-3)(x+2)$ $\therefore x = 3 \text{ or / of } x = -2$ $\therefore A(-2;0) \text{ and/en } B(3;0)$	<p>✓ factors / <i>faktore</i></p> <p>✓ A(-2;0) ✓ B(3;0)</p> <p>(3)</p>
<p>6.4</p>	$f(x) = g(x)$ $x^2 - x - 6 = 2x - 2$ $x^2 - 3x - 4 = 0$ $(x-4)(x+1) = 0$ $\therefore x = 4 \text{ or / of } x = -1$ $y = 2(4) - 2$ $= 6$ $\therefore E(4;6)$	<p>✓ equating <math>f(x)</math> and <math>g(x)</math> <i>gelykstel van <math>f(x)</math> en <math>g(x)</math></i></p> <p>✓ standard form / <i>standaardvorm</i></p> <p>✓ <math>x</math>-values / <math>x</math>-waardes</p> <p>✓ coordinates of E <i>koördinate van E</i></p> <p>(4)</p>
<p>6.5</p>	$y \geq -6\frac{1}{4} \text{ or / of } y \geq t$ $y \in [-6\frac{1}{4}; \infty) \text{ or / of } y \in [t; \infty)$	<p>✓ ✓ answer / <i>antwoord</i></p> <p>(2)</p>
<p>6.6</p>	$g(x) = 2x - 2$ $\therefore 0 = 2x - 2$ $\therefore x = 1$ $x \leq -2 \text{ or / of } 1 \leq x \leq 3$ <p style="text-align: center;"><b>OR/OF</b></p>  $\therefore x \leq -2 \text{ or / of } 1 \leq x \leq 3$	<p>✓ <math>x \leq -2</math> ✓ <math>1 \leq x \leq 3</math></p> <p>✓ <math>x \leq -2</math> ✓ <math>1 \leq x \leq 3</math></p> <p>(2)</p>
		<p>[19]</p>

## QUESTION 7/VRAAG 7

7.1	$f(x) = a^x + 1$ $9 = a^{-3} + 1$ $8 = a^{-3}$ $\therefore a^3 = \frac{1}{8}$ $\sqrt[3]{a^3} = \sqrt[3]{\frac{1}{8}}$ $\therefore a = \frac{1}{2}$	✓ substitution / <i>vervanging</i>  ✓ $a^3 = \frac{1}{8}$  ✓ answer / <i>antwoord</i>  (3)
7.2	$g(x) = -\left(\frac{1}{2}\right)^x + 1$	✓ $-\left(\frac{1}{2}\right)^x$ ✓ +1  (2)
		[5]

**QUESTION 8/VRAAG 8**

<p>8.1</p>	$1 + i_{eff} = \left(1 + \frac{i_{nom}}{12}\right)^{12}$ $1 + 0,0992 = \left(1 + \frac{x}{12}\right)^{12}$ $\therefore \sqrt[12]{1,0992} = \sqrt[12]{\left(1 + \frac{x}{12}\right)^{12}}$ $\therefore x = \left(\sqrt[12]{1,0992} - 1\right) \times 12$ $= 0,0950$ <p><math>\therefore</math> The rate is 9,5% p.a. compounded monthly.  <i>Die koers is 9,5% p.j. maandeliks saamgestel.</i></p>	<p>✓ substitution / <i>vervanging</i></p> <p>✓ simplification / <i>vereenvoudiging</i></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(3)</p>
<p>8.2</p>	$A = P(1 - i)^n$ $28\,607,30 = P(1 - 12\%)^7$ $P = \frac{A}{(1 - i)^n}$ $= \frac{28\,607,30}{(1 - 12\%)^7}$ $= R70\,000,00$	<p>✓ correct formula <i>korrekte formule</i></p> <p>✓ substitution / <i>vervanging</i></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(3)</p>





**QUESTION 9/VRAAG 9**

<p>9.1.1</p>	<p><math>P(A \text{ and/en } B) = 0</math>  <math>\therefore P(A \text{ or / of } B) = P(A) + P(B)</math>  <math>0,75 = 0,35 + P(B)</math>  <math>\therefore P(B) = 0,75 - 0,35</math>  <math>= 0,4 \text{ or / of } \frac{2}{5}</math></p>	<p>✓ correct formula / <i>korrekte formule</i>                  ✓ substitution / <i>vervanging</i></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(3)</p>
<p>9.1.2</p>	<p><math>P(A \text{ and / en } B) = P(A) \times P(B)</math>  <math>\therefore P(A \text{ or/of } B) = P(A) + P(B) - P(A).P(B)</math>  <math>0,75 = 0,35 + P(B) - 0,35P(B)</math>  <math>0,4 = 0,65P(B)</math>  <math>\therefore P(B) = \frac{0,4}{0,65}</math>  <math>= \frac{8}{13}</math></p>	<p>✓ correct formula / <i>korrekte formule</i>                  ✓ substitution / <i>vervanging</i></p> <p>✓ simplification / <i>vereenvoudiging</i>                  ✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(4)</p>
<p>9.2.1</p>		<p>✓ 18, 12 and/en <math>x</math> (intersections)                  ✓ <math>34 - x</math>                  ✓ <math>x</math> and/en <math>y</math>                  ✓ 8 and/en 11</p> <p style="text-align: right;">(4)</p>
<p>9.2.2</p>	<p><math>y + 12 + 11 + 18 = 81</math>  <math>y = 40</math>  <math>x + x + 11 + 12 + y + 18 + 34 - x + 8 = 130</math>  <math>x + 83 + 40 = 130</math>  <math>\therefore x = 7</math></p>	<p>✓ <math>y</math>-value / <math>y</math>-waarde                  ✓ equation / <i>vergelyking</i></p> <p>✓ <math>x</math>-value / <math>x</math>-waarde</p> <p style="text-align: right;">(3)</p>
<p>9.2.3</p>	<p><math>P(\text{only one/slegs een}) = \frac{34-x}{130} + \frac{x}{130} + \frac{y}{130}</math>  <math>= \frac{27}{130} + \frac{7}{130} + \frac{40}{130}</math>  <math>= \frac{74}{130} = \frac{37}{65} \approx 0,57</math></p>	<p>✓ method / <i>metode</i></p> <p>✓ answer / <i>antwoord</i></p> <p style="text-align: right;">(2)</p>
		<p><b>[16]</b></p>

## QUESTION 10/VRAAG 10

10.	<p> <math display="block">P(A) = P(MA) + P(\bar{M}A)</math> <math display="block">= (65\% \times 60\%) + (35\% \times 20\%)</math> <math display="block">= 46\%</math> <math display="block">= \frac{23}{50}</math> </p>	<p>           ✓ <math>P(A) = P(MA) + P(\bar{M}A)</math>            ✓ substitution / <i>vervanging</i>            ✓ answer / <i>antwoord</i> </p> <p style="text-align: right;">(5)</p> <p style="text-align: right;"><b>[5]</b></p>
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**TOTAL / TOTAAL: 150**