



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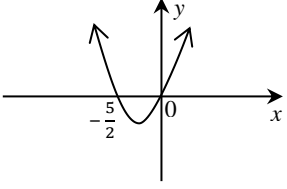
This marking guideline consists of 18 pages./  
*Hierdie nasienriglyn bestaan uit 18 bladsye.*

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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)

1.1.4	$\sqrt{x} - \sqrt{x-5} = 1$ $\sqrt{x} - 1 = \sqrt{x-5}$ $(\sqrt{x} - 1)^2 = (\sqrt{x-5})^2$ $x - 2\sqrt{x} + 1 = x - 5$ $6 = 2\sqrt{x}$ $(6)^2 = (2\sqrt{x})^2$ $\therefore 4x = 36$ $x = 9$	<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>
1.2	$2x - y = 1 \quad (1)$ $y^2 - xy = x + 7 \quad (2)$ $y = 2x - 1 \quad (3)$ <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

2.1	$\frac{2^{2x} - 4^{x+1}}{4^x + 2^{2x-1}}$ $= \frac{2^{2x} - 2^{2x+2}}{2^{2x} + 2^{2x-1}}$ $= \frac{2^{2x} - 2^{2x} \cdot 2^2}{2^{2x} + 2^{2x} \cdot 2^{-1}}$ $= \frac{2^{2x}(1 - 2^2)}{2^{2x}(1 + 2^{-1})} \text{ or / of } \frac{2^{2x}(1 - 4)}{2^{2x}(1 + \frac{1}{2})}$ $= \frac{-3}{\frac{3}{2}}$ $= -2$	<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>
2.2.1	$3x^{\frac{3}{2}} = 81$ $x^{\frac{3}{2}} = 27$ $\left(x^{\frac{3}{2}}\right)^{\frac{2}{3}} = (27)^{\frac{2}{3}}$ $\therefore x = 9$	<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>
2.2.2	$2^x + 5 = 3 \cdot 2^{1-x}$ $2^x + 5 = 3 \cdot 2 \cdot 2^{-x}$ $2^x + 5 = \frac{3 \cdot 2}{2^x}$ $(2^x)^2 + 5 \cdot 2^x - 6 = 0$ $(2^x + 6)(2^x - 1) = 0$ $\therefore 2^x \neq -6 \quad \text{or / of} \quad 2^x = 1$ $2^x = 2^0$ $\therefore x = 0$	<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></p> <p>✓ <math>a=2</math> ✓ <math>b=-1</math></p> <p style="text-align: right;">(5)</p>
		[17]

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## 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)

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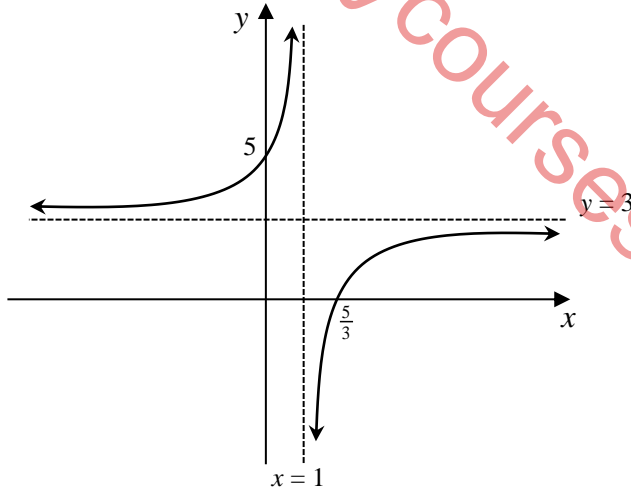
<p>3.2</p> <p><math>T_{11} = -19</math>      <math>T_{23} = 65</math></p> <p><math>-19 ; a ; b ; c ; e ; \dots ; 65</math></p> <p><math>a - (-19) = b - a = c - b = \dots = d</math></p> <p><math>\therefore</math> There are 12 common differences / <i>Daar is 12 gemeenskaplike verskille</i></p> <p><math>\therefore 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

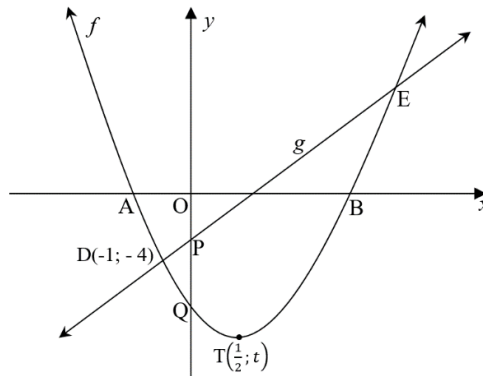
4.1	$  \begin{array}{cccc}  204 & ; & 176 & ; & 150 & ; & 126 \\  & \swarrow & \nearrow & \swarrow & \nearrow & \swarrow & \nearrow \\  & -28 & & -26 & & -24 & \\  & \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\  & & 2 & & 2 & &   \end{array}  $ <p>104 ; 84</p>	<p>✓ 104 ✓ 84</p> <p>(2)</p>
4.2	$  \begin{array}{l}  2a = 2 \qquad 3a + b = -28 \qquad a + b + c = -12 \\  \therefore a = 1 \qquad 3(1) + b = -28 \qquad 1 - 31 + c = 204 \\  \qquad \qquad \qquad b = -31 \qquad \qquad \qquad c = 234 \\  \\  \therefore T_n = n^2 - 31n + 234  \end{array}  $	<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>
4.3	$  \begin{array}{l}  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  \end{array}  $	<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>
4.4	$  \begin{array}{l}  n^2 - 31n + 234 = 0 \qquad \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} \ \& \ T_{17} = -4 \\  T_{15} \ \& \ T_{16} = -6  \end{array}  $	<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>
<b>[15]</b>		

## QUESTION 5/VRAAG 5

5.1	$x = 1$ $y = 3$	$\checkmark x = 1$ $\checkmark y = 3$	(2)
5.2	$0 = \frac{-2}{x-1} + 3$ $\frac{2}{x-1} = 3$ $3(x-1) = 2$ $x = \frac{5}{3}$ $y = \frac{-2}{x-1} + 3$ $= \frac{-2}{0-1} + 3$ $= 5$ $\therefore$ Intercepts are at / Afsnitte is by: $(\frac{5}{3}; 0)$ and / en $(0; 5)$	$\checkmark y = 0$ $\checkmark x = \frac{5}{3}$ $\checkmark y = 5$	(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)

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

QUESTION 6/VRAAG 6



6.1

$$f(x) = ax^2 + bx + c$$

P is at/by:  $(0; -2)$

Q is at/by:  $(0; -6)$

$$\therefore f(x) = ax^2 + bx - 6$$

$$-4 = (-1)^2 a + (-1)b - 6$$

$$2 = a - b \dots \dots \dots (1)$$

$$\text{At TP/By DP: } x = \frac{-b}{2a}$$

$$\frac{1}{2} = \frac{-b}{2a}$$

$$\therefore 2a = -2b$$

$$a = -b \dots \dots \dots (2)$$

$$\therefore 2 = -b - b$$

$$2 = -2b$$

$$b = -1$$

$$\therefore a = -(-1)$$

$$= 1$$

✓  $c = -6$

✓  $a - b = 2$

✓ substitute for  $x$  / *vervang vir  $x$*

✓  $a = -b$

✓ values of  $a$  and  $b$ .  
*waardes van  $a$  en  $b$*

(5)

6.2

$$f(x) = x^2 - x - 6$$

$$= x^2 - x + \frac{1}{4} - \frac{1}{4} - 6$$

$$= \left(x - \frac{1}{2}\right)^2 - 6\frac{1}{4}$$

$$t = -6\frac{1}{4}$$

**OR/OF**

$$f(x) = x^2 - x - 6$$

$$\therefore y = \left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right) - 6$$

$$= -6\frac{1}{4}$$

$$\therefore t = -6\frac{1}{4}$$

✓ completing the square  
*vierkantsvoltooiing*

✓ factorisation / *faktorisering*

✓  $t = -6\frac{1}{4}$

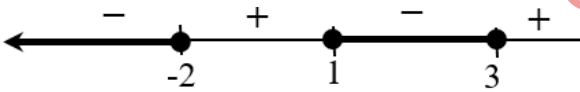
**OR/OF**

✓  $f\left(\frac{1}{2}\right)$

✓  $y = -6\frac{1}{4}$

✓  $t = -6\frac{1}{4}$

(3)

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

## QUESTION 7/VRAAG 7

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

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## QUESTION 8/VRAAG 8

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

8.3.1	$A = P(1+i)^n$ $A = \left( \left( 32000 \left( 1 + \frac{0,086}{12} \right)^{36} \right) + 23000 \right) \left( 1 + \frac{0,086}{12} \right)^{12}$ $= R70141,04$ <p style="text-align: center;"><b>OR/OF</b></p> $A = P(1+i)^n$ $= 32000 \left( 1 + \frac{0,086}{12} \right)^{48} + 23000 \left( 1 + \frac{0,086}{12} \right)^{12}$ $= R70141,04$	$\checkmark i = \frac{0,082}{12}$ $\checkmark \left( 32000 \left( 1 + \frac{0,086}{12} \right)^{36} \right)$ $\checkmark +23000$ $\checkmark \times \left( 1 + \frac{0,086}{12} \right)^{12}$ $\checkmark \text{ answer / antwoord}$ $\checkmark i = \frac{0,082}{12}$ $\checkmark \left( 32000 \left( 1 + \frac{0,086}{12} \right)^{48} \right)$ $\checkmark 23000 \left( 1 + \frac{0,086}{12} \right)^{12}$ $\checkmark \text{ adding / optelling}$ $\checkmark \text{ answer / antwoord}$ <p style="text-align: right;">(5)</p>
8.3.2	$A = P(1+i)^n$ $= 70141,04 \left( 1 + \frac{0,105}{4} \right)^8$ $= R86297,36$ <p><math>\therefore</math> Loan / Lening : <math>R220000 - R86297,36</math></p> $= R133702,64$	$\checkmark P = R70\ 141,04$ $\checkmark \text{ substitution / vervanging}$ $\checkmark R86297,36$ $\checkmark \text{ answer / antwoord}$ <p style="text-align: right;">(4)</p>
<b>[15]</b>		



## QUESTION 9/VRAAG 9

9.1.1	$P(A \text{ and/en } B) = 0$ $\therefore P(A \text{ or / of } B) = P(A) + P(B)$ $0,75 = 0,35 + P(B)$ $\therefore P(B) = 0,75 - 0,35$ $= 0,4 \text{ or / of } \frac{2}{5}$	<ul style="list-style-type: none"> <li>✓ correct formula / <i>korrekte formule</i></li> <li>✓ substitution / <i>vervanging</i></li>   <li>✓ answer / <i>antwoord</i></li> </ul>	(3)
9.1.2	$P(A \text{ and / en } B) = P(A) \times P(B)$ $\therefore P(A \text{ or/of } B) = P(A) + P(B) - P(A).P(B)$ $0,75 = 0,35 + P(B) - 0,35P(B)$ $0,4 = 0,65P(B)$ $\therefore P(B) = \frac{0,4}{0,65}$ $= \frac{8}{13}$	<ul style="list-style-type: none"> <li>✓ correct formula / <i>korrekte formule</i></li> <li>✓ substitution / <i>vervanging</i></li>   <li>✓ simplification / <i>vereenvoudiging</i></li> <li>✓ answer / <i>antwoord</i></li> </ul>	(4)
9.2.1		<ul style="list-style-type: none"> <li>✓ 18, 12 and/en <math>x</math> (intersections)</li> <li>✓ <math>34 - x</math></li> <li>✓ <math>x</math> and/en <math>y</math></li> <li>✓ 8 and/en 11</li> </ul>	(4)
9.2.2	$y + 12 + 11 + 18 = 81$ $y = 40$ $x + x + 11 + 12 + y + 18 + 34 - x + 8 = 130$ $x + 83 + 40 = 130$ $\therefore x = 7$	<ul style="list-style-type: none"> <li>✓ <math>y</math>-value / <math>y</math>-waarde</li> <li>✓ equation / <i>vergelyking</i></li>   <li>✓ <math>x</math>-value / <math>x</math>-waarde</li> </ul>	(3)
9.2.3	$P(\text{only one/slegs een}) = \frac{34-x}{130} + \frac{x}{130} + \frac{y}{130}$ $= \frac{27}{130} + \frac{7}{130} + \frac{40}{130}$ $= \frac{74}{130} = \frac{37}{65} \approx 0,57$	<ul style="list-style-type: none"> <li>✓ method / <i>metode</i></li>   <li>✓ answer / <i>antwoord</i></li> </ul>	(2)
			<b>[16]</b>

## 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) [5]</p>
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TOTAL / TOTAAL: 150