



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
*NASIONALE
SENIOR SERTIFIKAAT***

GRADE/*GRAAD* 11

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2016

MEMORANDUM

MARKS/*PUNTE*: 150

**This memorandum consists of 15 pages.
*Hierdie memorandum bestaan uit 15 bladsye.***

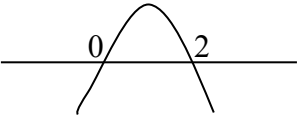
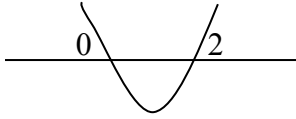
NOTE:

- 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 memorandum.
- 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 memorandum van toepassing.
- Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.

QUESTION/VRAAG 1

1.1.1	$3x^2 - 5x - 1 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(-1)}}{2(3)}$ $= \frac{5 \pm \sqrt{37}}{6}$ $x = 1,85 \text{ or } x = -0,18$	<p>✓ substitution/vervanging</p> <p>✓ answer/antwoord</p> <p>✓ answer/antwoord</p> <p>(3)</p>
1.1.2	$x^2 - 6x + 8 = 0$ $(x - 4)(x - 2) = 0$ $x = 4 \text{ or } x = 2$	<p>✓ factors/faktore</p> <p>✓ $x = 4$</p> <p>✓ $x = 2$</p> <p>(3)</p>
1.1.3	<p>Option/Opsie 1 OR/OF Option/Opsie 2</p> $4x - 2x^2 < 0$ $2x(2 - x) < 0$ $x < 0 \text{ or } x > 2$ 	$4x - 2x^2 < 0$ $-2x^2 + 4x < 0$ $2x^2 - 4x > 0$ $x(2x - 4) > 0$ $x < 0 \text{ or } x > 2$  <p>✓ factors/faktore</p> <p>✓ method/metode</p> <p>✓ $x < 0$</p> <p>✓ $x > 2$</p> <p>(4)</p>

1.1.4	$2^{3x+1} + 2^{3x} = 12$ $2^{3x} [2^1 + 1] = 12$ $2^{3x} \cdot 3 = 12$ $2^{3x} = 4$ $2^{3x} = 2^2$ $3x = 2$ $\therefore x = \frac{2}{3}$	<ul style="list-style-type: none"> ✓ common/<i>gemene</i> factor ✓ simplification/<i>vereenv.</i> ✓ equating/<i>gelykst</i> exponents ✓ answer/<i>antw.</i> <p style="text-align: right;">(4)</p>
1.1.5	$\sqrt{x-1} + 3 = x - 4$ $\sqrt{x-1} = x - 4 - 3$ $x - 1 = (x - 7)^2$ $x - 1 = x^2 - 14x + 49$ $x^2 - 15x + 50 = 0$ $(x - 5)(x - 10) = 0$ $x \neq 5 \text{ or } x = 10$	<ul style="list-style-type: none"> ✓ isolate/<i>isoleer</i> $\sqrt{\quad}$ sign/<i>teken</i> ✓ squaring/<i>kwadr</i> both sides ✓ std form/<i>stand vorm</i> ✓ factors/<i>fakt</i> ✓ $x \neq 5$ ✓ $x = 10$ <p style="text-align: right;">(6)</p>
1.2	$3x - y + 2 = 0 \quad \text{and} \quad y = -x^2 + 2x + 8$ $\therefore y = 3x + 2$ $3x + 2 = -x^2 + 2x + 8$ $x^2 + x - 6 = 0$ $(x + 3)(x - 2) = 0$ $x = -3 \text{ or } x = 2$ $y = 3(-3) + 2 \quad \text{or} \quad y = 3(2) + 2$ $= -7 \quad \text{or} \quad y = 8$	<ul style="list-style-type: none"> ✓ $y = 3x + 2$ ✓ substitution/<i>verv</i> ✓ std form/<i>stand vorm</i> ✓ factors/<i>fakt</i> ✓ x-values/<i>wrdes</i> ✓ y-values/<i>wrdes</i> <p style="text-align: right;">(6)</p>
1.3	$3x^2 + (k + 2)x = 1 - k$ $3x^2 + (k + 2)x - 1 + k = 0$ $\Delta = b^2 - 4ac$ $= (k + 2)^2 - 4(3)(-1 + k)$ $= k^2 + 4k + 4 + 12 - 12k$ $= k^2 - 8k + 16$ $= (k - 4)^2$ $\therefore b^2 - 4ac \text{ is a perfect square.}$ <p>Roots are real and rational.</p>	<ul style="list-style-type: none"> ✓ std form/<i>stand vorm</i> ✓ substitution/<i>verv</i> ✓ $k^2 - 8k + 16$ ✓ $(k - 4)^2$ <p style="text-align: right;">(4)</p>

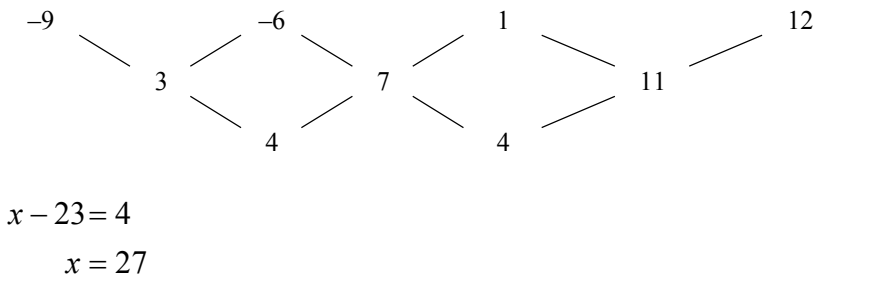
[30]

QUESTION/VRAAG 2

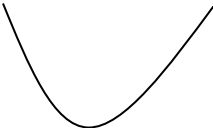
2.1.1	$\frac{5^a \cdot 5^{-2} \cdot 2^a \cdot 2^2}{10^a - 10^a \cdot 10^{-1} \cdot 2}$ $= \frac{(5 \cdot 2)^a \cdot 5^{-2} \cdot 2^2}{10^a \left[1 - \frac{2}{10} \right]}$ $= \frac{10^a \cdot \frac{4}{25}}{10^a \cdot \frac{8}{10}}$ $= \frac{4}{25} \times \frac{10}{8}$ $= \frac{1}{5}$	<p>✓ writing as separate bases/ <i>skryf as priembasisse</i></p> <p>✓ multiplication of bases with same exponents/<i>vermenigv. van basisse met dies. eksp.</i></p> <p>✓ common/<i>gemene</i> factor</p> <p>✓ simplification/<i>vereenv.</i></p> <p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(5)</p>
2.1.2	$\frac{\sqrt{27m^6} - \sqrt{48m^6}}{\sqrt{12m^6}}$ $= \frac{3 \cdot \sqrt{3} m^3 - 4 \cdot \sqrt{3} m^3}{2\sqrt{3} m^3}$ $= \frac{\sqrt{3} m^3 (3 - 4)}{2\sqrt{3} m^3}$ $= \frac{-\sqrt{3} m^3}{2\sqrt{3} m^3}$ $= -\frac{1}{2}$ <p>OR/OF</p> $= \frac{3 \cdot \sqrt{3m^6} - 4 \cdot \sqrt{3m^6}}{2\sqrt{3m^6}}$ $= \frac{\sqrt{3m^6} (3 - 4)}{2 \cdot \sqrt{3m^6}}$ $= \frac{3 - 4}{2}$ $= -\frac{1}{2}$	<p>✓ simplification of surds/<i>vereenv. van wortels</i></p> <p>✓ simplification of numerator/<i>vereenv. van teller</i></p> <p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(3)</p> <p>✓ simplification of surds/<i>vereenv. van wortels</i></p> <p>✓ simplification of numerator/<i>vereenv. van teller</i></p> <p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(3)</p>

2.2	$\begin{aligned} \text{LHS} &= \frac{4\sqrt{2} - 8(1 + \sqrt{2})}{2\sqrt{2}(1 + \sqrt{2})} \\ &= \frac{-4\sqrt{2} - 8}{2\sqrt{2}(1 + \sqrt{2})} \\ &= \frac{-4(\sqrt{2} + 2)}{2(\sqrt{2} + 2)} \\ &= -2 \\ &= \text{RHS} \end{aligned}$ <p>OR/OF</p> $\begin{aligned} \text{LHS} &= \frac{2}{1 + \sqrt{2}} \times \frac{1 - \sqrt{2}}{1 - \sqrt{2}} - \frac{8 \times \sqrt{8}}{\sqrt{8} \times \sqrt{8}} \\ &= \frac{2 - 2\sqrt{2}}{1 - 2} - \sqrt{8} \\ &= -2 + 2\sqrt{2} - 2\sqrt{2} \\ &= -2 \\ &= \text{RHS} \end{aligned}$	<p>✓ LCD/KGN ✓ numerator/teller</p> <p>✓ simplification/ vereenv.</p> <p>✓ common/gemene factor</p> <p>(4)</p> <p>✓✓ rationalise the denominator of both fractions/ras. die noemer van beide breuke</p> <p>✓ $-2 + 2\sqrt{2}$ ✓ $-2 - \sqrt{2}$</p> <p>(4) [12]</p>
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QUESTION/VRAAG 3

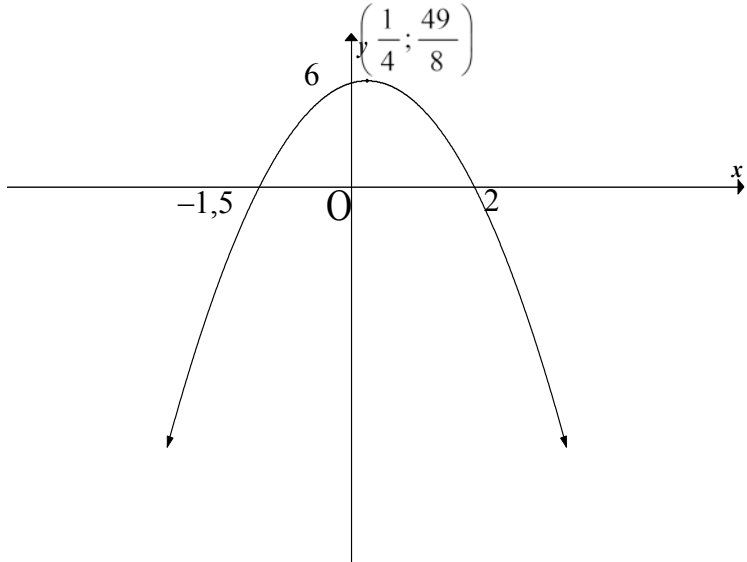
<p>3.1</p>	 <p>$x - 23 = 4$ $x = 27$</p>	<p>✓ answer/antw. (1)</p>
<p>3.2</p>	<p>$2a = 4$ $a = 2$ $3a + b = 3$ $6 + b = 3$ $b = -3$ $a + b + c = -9$ $2 - 3 + c = -9$ $c = -8$ $T_n = 2n^2 - 3n - 8$</p>	<p>✓ $a = 2$ ✓ $b = -3$ ✓ $c = -8$ ✓ $T_n = 2n^2 - 3n - 8$ (4)</p>
<p>3.3</p>	<p>$T_n = 2n^2 - 3n - 8 + 3$ $= 2n^2 - 3n - 5$</p>	<p>✓ answer/antw. (1)</p>
<p>3.4</p>	<p>$T_n = 400$ $2n^2 - 3n - 5 = 400$ $2n^2 - 3n - 405 = 0$ $(n - 15)(2n + 27) = 0$ $n = 15 \text{ or } n \neq \frac{-27}{2}$</p> <p>OR</p> <p>$2n^2 - 3n - 8 = 397$ $2n^2 - 3n - 405 = 0$ $(n - 5)(2n + 27) = 0$ $n = 15 \text{ or } n \neq -\frac{27}{2}$</p>	<p>✓ equating/verg. ✓ std form/stand vorm ✓ factorisation/fakt. ✓ $n = 15$ (4)</p> <p>✓ equating/verg. ✓ std form/stand vorm ✓ factorisation/fakt. ✓ $n = 15$ (4) [10]</p>

QUESTION/VRAAG 4

<p>4.1.1</p>	$ \begin{array}{c} 18 \qquad \qquad 14 \qquad \qquad 10 \\ \diagdown \quad \diagup \quad \diagdown \quad \diagup \\ \qquad -4 \qquad \qquad -4 \\ \\ T_4 = 6 \end{array} $	<p>✓ answer/antw. (1)</p>
<p>4.1.2</p>	$ \begin{aligned} T_n &= a + (n-1)d \\ &= 18 + (n-1)(-4) \\ &= -4n + 22 \end{aligned} $	<p>✓ substitution/verv. ✓ answer/antw. (2)</p>
<p>4.1.3</p>	$ \begin{aligned} T_n &= 22 - 4n \\ -70 &= 22 - 4n \\ -92 &= -4n \\ n &= 23 \end{aligned} $	<p>✓ substitution/verv. ✓ answer/antw. (2)</p>
<p>4.1.4</p>	$ \begin{aligned} Q_{510} - Q_{509} &= T_{509} \text{ of the linear sequence} \\ &= 22 - 4 \times 509 \\ &= -2014 \end{aligned} $	<p>✓ making association/ass. ✓ answer/antw. (2)</p>
<p>4.2.1</p>	$ \begin{aligned} 2a &= 2 \\ \therefore a &= 1 \\ \therefore a &> 0 \\ \therefore \text{ this pattern has a minimum value.} \\ \text{The shape of the graph will be} \end{aligned} $ 	<p>✓ value/wrde of a ✓ $a > 0$ ✓ minimum value/wrde (3)</p>
<p>4.2.2</p>	$ \begin{aligned} T_n &= 1(n+p)^2 + q \\ \text{A.O.S} &= \frac{5+17}{2} \\ p &= 11 \\ \therefore T_n &= 1(n-11)^2 + q \\ 29 &= 1(17-11)^2 + q \\ \therefore q &= -7 \\ \therefore T_n &= (n-11)^2 - 7 \\ T_n &= n^2 - 22n + 114 \end{aligned} $ <p>OR/OF</p>	<p>✓ axis of symmetry/simm. as ✓ value/wrde of p ✓ substitution/verv. (17 ; 29) or/of (5 ; 29) ✓ value/wrde of q ✓ answer/antw. (5)</p>

$T_5 = 29$ $\therefore 1(5)^2 + 5b + c = 29$ $\text{ie } 5b + c = 4 \dots (1)$ $\text{and } T_{17} = 29$ $\therefore 1(17)^2 + 17b + c = 29$ $\text{ie } 17b + c = -260 \dots (2)$ $\text{solve the equations simultaneously}$ $-12b = 264$ $\therefore b = -22$ substitute in (1) $\text{ie } 5(-22) + c = 4$ $-110 + c = 4$ $\therefore c = 114$ $\therefore T_n = n^2 - 22n + 114$	$\checkmark \checkmark \text{ equations/verg.}$ $(1) \ \& \ (2)$ $\checkmark \text{ value/wrde of } b$ $\checkmark \text{ value/wrde of } c$ $\checkmark \text{ answer/antw.}$ (5) $[15]$
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QUESTION 5

<p>5.1</p>	$x = -\frac{b}{2a}$ $= -\frac{1}{2(-2)}$ $= \frac{1}{4}$ $\therefore y = -2\left(\frac{1}{4}\right)^2 + \left(\frac{1}{4}\right) + 6$ $y = \frac{49}{8}$	<p>✓ substitution/<i>verv.</i></p> <p>✓ x-value/<i>wrde</i></p> <p>✓ substitution/<i>verv.</i></p> <p>✓ y-value/<i>wrde</i></p> <p>(4)</p>
<p>5.2</p>	$y = -2(0)^2 + 0 + 6$ $\therefore y \text{ intercept } (0;6)$	<p>✓ y-value/<i>wrde</i></p> <p>(1)</p>
<p>5.3</p>	<p>x intercepts</p> $0 = -2x^2 + x + 6$ $0 = 2x^2 - x - 6$ $0 = (2x + 3)(x - 2)$ $\therefore x = 2 \text{ or } x = -\frac{3}{2}$ <p>$(2;0)$ and $\left(-\frac{3}{2};0\right)$</p>	<p>✓ $y = 0$</p> <p>✓ factorisation/<i>fakt.</i></p> <p>✓ ✓ x-values/<i>wrde</i></p> <p>(4)</p>
<p>5.4</p>		<p>✓ shape/<i>vorm</i></p> <p>✓ intercepts/<i>afsnitte</i></p> <p>✓ turning point/<i>drpnt</i></p> <p>(3)</p>
<p>5.5</p>	$k = \frac{49}{8}$	<p>✓ ✓ answer/<i>antw.</i></p> <p>(2)</p>
<p>5.6</p>	<p>New/<i>Nuwe</i> turning point/<i>drpn.t</i> $\left(\frac{9}{4}; \frac{57}{8}\right)$</p> <p>Equation/<i>verg.</i> of h</p> $y = -2\left(x - \frac{9}{4}\right)^2 + \frac{57}{8}$	<p>✓ ✓ turning points/<i>drpnt</i></p> <p>✓ equation/<i>verg.</i> (3)</p> <p>OR/OF</p> <p>✓ ✓ ✓ answer only (3)</p> <p>[17]</p>

QUESTION/VRAAG 6

6.1	$x = -3$ and $y = -1$	<ul style="list-style-type: none"> ✓ $x = -3$ ✓ $y = -1$ <p style="text-align: right;">(2)</p>
6.2	$x \in R ; x \neq -3$	<ul style="list-style-type: none"> ✓✓ answer/antw. <p style="text-align: right;">(2)</p>
6.3.1	<p>At B, $x = 0$</p> $\therefore y = \frac{1}{0+3} - 1$ $y = -\frac{2}{3}$ $\therefore OB = \frac{2}{3} \text{ units}$	<ul style="list-style-type: none"> ✓ substituton/verv. ✓ answer/antw. <p style="text-align: right;">(2)</p>
6.3.2	<p>At A, $y = 0$</p> $0 = \frac{1}{x+3} - 1$ $1 = \frac{1}{x+3}$ $x+3 = 1$ $x = -2$ $\therefore OA = 2 \text{ units}$	<ul style="list-style-type: none"> ✓ substitution/verv. ✓ simplification/vereenv. ✓ answer/antw. <p style="text-align: right;">(3)</p>
6.4	$\frac{1}{x+3} - 1 = \frac{1}{2}x$ $2 - 2(x+3) = x(x+3)$ $x^2 + 3x - 2 + 2x + 6 = 0$ $x^2 + 5x + 4 = 0$ $(x+4)(x+1) = 0$ $x = -4 \text{ or } x = -1$ <p>when $x = -1 ; y = -\frac{1}{2}$</p> <p>when $x = -4 ; y = -2$</p> $\therefore C \left(-1; -\frac{1}{2}\right) \text{ and } D (-4 ; -2)$	<ul style="list-style-type: none"> ✓ equating the two equations/ verg. van 2 vergelykings ✓ std vorm/std vorm ✓ factors/fakt. ✓ x-values/wrds ✓ co-ordinates/koörd of C ✓ co-ordinates/ koörd of D <p style="text-align: right;">(6)</p>

6.5	$\frac{1}{x+3} \geq \frac{x+2}{2}$ $\frac{1}{x+3} \geq \frac{x}{2} + 1$ $\frac{1}{x+3} - 1 \geq \frac{x}{2}$ $\therefore f(x) \geq g(x)$ $\therefore x \leq 4 \text{ or } -3 < x \leq -1$	<p>✓ simplification/<i>vereen</i></p> <p>✓ $f(x) \geq g(x)$ ✓ $x \leq -4$ ✓ $-3 < x \leq -1$</p> <p style="text-align: right;">(4) [19]</p>
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QUESTION/VRAAG 7

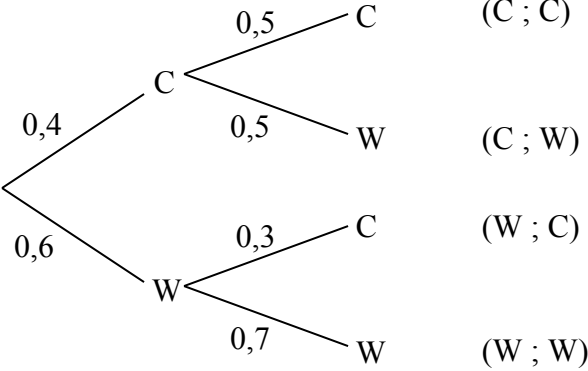
7.1	$q = 2$ $f(x) = 2 \cdot b^{x+1} + 2$ $20 = 2 \cdot b^{1+1} + 2$ $18 = 2 \cdot b^2$ $9 = b^2$ $b = 3$ $f(x) = 2 \cdot 3^{x+1} + 2$	<p>✓ substitution of $q = 2$</p> <p>✓ substitution of 1 and 20</p> <p>✓ value/<i>wrde</i> of b</p> <p style="text-align: right;">(3)</p>
7.2	$y = 2 \cdot 3^{-1+1} + 2$ $y = 2 \cdot 1 + 2$ $y = 4$	<p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(1)</p>
7.3	$m = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{20 - 4}{1 - (-1)}$ $= 8$	<p>✓ substitution/<i>verv.</i></p> <p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(2)</p>
7.4	$h(x) = -2 \cdot 3^{x+1} + 2$ <p>OR/OF Reflected about the x-axis $= -2 \cdot 3^{x+1} - 2$ \therefore Reflected about the asymptote $h(x) = -2 \cdot 3^{x+1} - 2 + 4$ $= -2 \cdot 3^{x+1} + 2$</p>	<p>✓✓ answer/<i>antw.</i></p> <p>✓✓ answer/<i>antw.</i></p> <p style="text-align: right;">(2)</p>
7.5	$y < 2$	<p>✓ answer/<i>antw.</i></p> <p style="text-align: right;">(1) [9]</p>

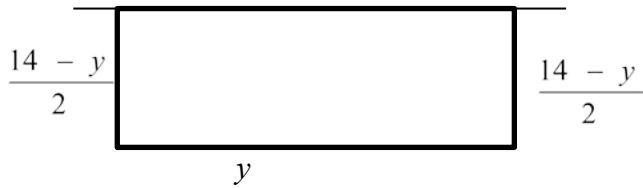
QUESTION/VRAAG 8

8.1	$A = P(1-i)^n$ $= R\ 25\ 000 (1-0,09)^4$ $= R\ 17\ 143,74$	✓ $A = P(1-i)^n$ ✓ substitution/verv. ✓ answer/antw. (3)
8.2	$1 + i_{eff} = \left(1 + \frac{i_{nom}}{m}\right)^m$ $1 + i_{eff} = \left(1 + \frac{0,1235}{12}\right)^{12}$ $i_{eff} = \left(1 + \frac{0,1235}{12}\right)^{12} - 1$ $\therefore \text{Rate} = 0,13073 \times 100$ $= 13,07\%$ <p>The effective interest rate/Die effektiewe rentekoers is 13.07%</p>	✓ formula/for. ✓ substitution//verv. ✓ simplificationvereenv. ✓ answer/antw. (4)
8.3	$A = P(1+i)^n$ $R\ 221\ 292,32 = R\ 145\ 000 \left(1 + \frac{r}{100}\right)^6$ $\sqrt[6]{\frac{R\ 221\ 292,32}{145\ 000}} = 1 + \frac{r}{100}$ $\frac{r}{100} = 0,07300000324$ $r = 7,3\%$	✓ correct substitution into correct formula ✓ $n = 6$ ✓ $\sqrt[6]{\frac{R\ 221\ 292,32}{145\ 000}} = 1 + \frac{r}{100}$ ✓ answer/antw. (4)
8.4	$A = 15\ 000 \left(1 + \frac{0,096}{4}\right)^{12} - 5\ 000 \left(1 + \frac{0,096}{4}\right)^{10} + 3\ 500 \left(1 + \frac{0,096}{4}\right)^4$ $= R\ 17\ 448,46$	✓ $\frac{0,096}{4}$ ✓ $15\ 000 \left(1 + \frac{0,096}{4}\right)^{12}$ ✓ $5\ 000 \left(1 + \frac{0,096}{4}\right)^{10}$ ✓ $3\ 500 \left(1 + \frac{0,096}{4}\right)^4$ ✓ answer/antw. (5)

[16]

QUESTION/VRAAG 9

<p>9.1</p>	<p>Given/Gegee: $P(A) = 0,2$ $P(B) = 0,5$ $P(A \text{ or } B) = 0,6$</p> <p>9.1.1 $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,6 = 0,2 + 0,5 - P(A \text{ and } B)$ $P(A \text{ and } B) = 0,1$</p>	<p>$\checkmark 0,6 = 0,2 + 0,5 - P(A \text{ and } B)$ $\checkmark P(A \text{ and } B) = 0,1$</p> <p>(2)</p>
<p>9.1.2</p>	<p>$P(A \text{ and } B) = 0,1$ $P(A) \times P(B) = 0,2 \times 0,5$ $= 0,1$ $\therefore P(A \text{ and } B) = P(A) \times P(B)$ $\therefore A \text{ and } B \text{ are independent}$</p>	<p>$\checkmark P(A) \times P(B) = 0,1$ $\checkmark P(A \text{ and } B) = P(A) \times P(B)$ $\checkmark \text{ conclusion} \quad (3)$</p>
<p>9.2.1</p>	<p>$a = 15$ $b = 1$ $c = 38$ $d = 3$ $e = 37$</p>	<p>$\checkmark a = 15$ $\checkmark b = 1$ $\checkmark c = 38$ $\checkmark d = 3$ $\checkmark e = 37$</p> <p>(5)</p>
<p>9.2.2</p>	<p>$P(\text{one learner plays netball or volleyball}) = \frac{25}{100} = \frac{1}{4}$</p>	<p>$\checkmark 25$ $\checkmark \text{ answer/antwoord} \quad (2)$</p>
<p>9.3.1</p>		<p>$\checkmark \text{ branch at first level}$ $\checkmark \text{ branches at second level}$ $\checkmark \text{ probabilities and outcomes}$</p> <p>(3)</p>



Let the length be y

Width be $\frac{14-y}{2}$

$$\text{Area} = y\left(7 - \frac{1}{2}y\right)$$

$$= \frac{-1}{2}y^2 + 7y$$

$$y = \frac{-7}{2\left(\frac{-1}{2}\right)}$$

$$= 7m$$

$$\text{width} = 3,5m$$

OR

$$\text{Area} = y\left(7 - \frac{1}{2}y\right)$$

$$= \frac{-1}{2}y^2 + 7y$$

$$= \frac{-1}{2}(y^2 - 14y)$$

$$= \frac{-1}{2}(y-7)^2 + \frac{49}{2}$$

$$\text{length} = 7m$$

$$\text{width} = 3,5m$$

✓ area formula/oppervl.for.

$$y = \frac{-7}{2\left(\frac{-1}{2}\right)}$$

✓ answer for y

✓ answer for width

(4)

✓ area formula/oppervl.for.

✓ completing the square

✓ answer for y

✓ answer for width

(4)

[4]

TOTAL/TOTAAL:

150