



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 11

MATHEMATICS P1/WISKUNDE V1

NOVEMBER 2017

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150

**These marking guidelines consist of 16 pages.
Hierdie nasienriglyne bestaan uit 16 bladsye.**

NOTE:

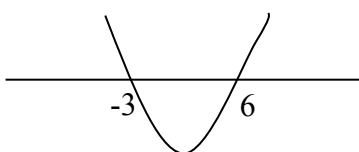
- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

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

QUESTION/VRAAG 1

1.1.1	$(2x - 3)(x + 7) = 0$ $x = \frac{3}{2}$ or $x = -7$	$\checkmark x = \frac{3}{2}$ $\checkmark x = -7$	(2)
1.1.2	$7x^2 + 3x - 2 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(3) \pm \sqrt{(3)^2 - 4(7)(-2)}}{2(7)}$ $= \frac{-3 \pm \sqrt{65}}{14}$ $x = -0,79$ or $x = 0,36$ NOTE/LET WEL: Penalty 1 mark for incorrect rounding <i>Penalisering 1 punt vir verkeerde afronding</i>	$\checkmark$ substitution/vervanging $\checkmark$ answer/antwoord $\checkmark$ answer/antwoord	(3)
1.1.3	$\sqrt{x-1} + 3 = x$ $\sqrt{x-1} = x - 3$ $(\sqrt{x-1})^2 = (x-3)^2$ $x - 1 = x^2 - 6x + 9$ $x^2 - 7x + 10 = 0$ $(x-2)(x-5) = 0$ $x \neq 2$ or / of $x = 5$	$\checkmark$ isolate/soleer $\sqrt{\quad}$ sign/teken $\checkmark$ squaring/kwadr both sides/ beide kante $\checkmark$ std form/stand vorm $\checkmark$ factors/fakt $\checkmark x = 5$ $\checkmark x \neq 2$	(6)

1.1.4	$x^2 > 3(x + 6)$ $x^2 - 3x - 18 > 0$ $(x - 6)(x + 3) > 0$  $x < -3 \text{ or } x > 6 \quad \textbf{OR/OR} \quad x \in (-\infty ; -3) \cup (6 ; \infty)$	✓std form/<i>vorm</i> ✓factors/<i>fakt</i> ✓ $x < -3$ OR/OR $(-\infty ; -3)$ ✓ $x > 6$ OR/OR $(6 ; \infty)$ (4)
1.2	$x = 1 - 2y$ $(1 - 2y)^2 + y^2 + 3y(1 - 2y) + y = 0$ $1 - 4y + 4y^2 + y^2 + 3y - 6y^2 + y = 0$ $1 - y^2 = 0$ $(1 - y)(1 + y) = 0$ $y = 1 \quad \text{or} \quad y = -1$ $x = -1 \quad \text{or} \quad x = 3$ OR/OR $y = \frac{1 - x}{2}$ $x^2 + \left(\frac{1 - x}{2}\right)^2 + 3x\left(\frac{1 - x}{2}\right) + \frac{1 - x}{2} = 0$ $x^2 + \frac{1 - 2x + x^2}{4} + \frac{3x - 3x^2}{2} + \frac{1 - x}{2} = 0$ $4x^2 + 1 - 2x + x^2 + 6x - 6x^2 + 2 - 2x = 0$ $-x^2 + 2x + 3 = 0$ $x^2 - 2x - 3 = 0$ $(x - 3)(x + 1) = 0$ $x = 3 \quad \text{or} \quad x = -1$ $y = -1 \quad \text{or} \quad y = 1$	✓ $x = 1 - 2y$ ✓substitution/<i>verv</i> ✓std form/<i>stand vorm</i> ✓factors/<i>fakt</i> ✓y-values/<i>wrdes</i> ✓x-values/<i>wrdes</i> ✓ $y = \frac{1 - x}{2}$ ✓substitution/<i>verv</i> ✓std form/<i>stand vorm</i> ✓factors/<i>fakt</i> ✓x-values/<i>wrdes</i> ✓y-values/<i>wrdes</i> (6)
1.3	$3 - 12k^2 = 0$ $1 - 4k^2 = 0$ $k^2 = \frac{1}{4}$ $k = \pm \frac{1}{2}$	✓ $3 - 12k^2 = 0$ ✓ $k^2 = \frac{1}{4}$ ✓ $k = \pm \frac{1}{2}$ (3) [24]

QUESTION/VRAAG 2

2.1	$\frac{3^{m+4} - 6.3^{m+1}}{7.3^{m+2}}$ $= \frac{3^{m+1}(3^3 - 6)}{7.3^{m+1}.3}$ $= \frac{3^3 - 6}{7.3}$ $= \frac{21}{21}$ $= 1$ OR/OF $\frac{3^{m+4} - 6.3^{m+1}}{7.3^{m+2}}$ $= \frac{3^m(3^4 - 6.3)}{3^m(7.3^2)}$ $= \frac{3^m.63}{3^m.63}$ $= 1$	✓ common factor/<i>gemene fakt</i> ✓ $3^3 - 6$ ✓ simplification/<i>vereenv.</i> ✓ answer/<i>antw.</i> ✓ common factor /<i>gemene fakt</i> ✓ $(3^4 - 6.3)$ ✓ simplification/<i>vereenv.</i> ✓ answer/<i>antw.</i> (4)
2.2.1	$x^{\frac{-3}{4}} = 8$ $x = (2^3)^{\frac{4}{-3}}$ $x = 2^{-4}$ $x = \frac{1}{16}$ OR/OF $x^{\frac{3}{4}} = 8$ $\sqrt[4]{x^{-3}} = 2^3$ $x^{-3} = 2^{12} \quad (4096)$ $x^{-1} = 2^4 \quad (16)$ $x = 2^{-4}$ $x = \frac{1}{16}$	✓ change to prime base/ <i>verander na priembasis</i> ✓ rational exponent/ <i>rasionele eksp</i> ✓ answer in any form/ <i>antw. in enige vorm</i> (3) ✓ use of surds/<i>gebr van wortls</i> ✓ $x^{-1} = 2^4$ ✓ answer in any form/<i>antw. in enige vorm</i> (3)

2.2.2	$2^{2x} - 2^x = 2$ $2^{2x} - 2^x - 2 = 0$ $(2^x + 1)(2^x - 2) = 0$ $2^x \neq -1 \quad \text{or} \quad 2^x = 2$ $x = 1$ NOTE/ LET WEL: If answer only of $x = 1$: award 1/4 marks <i>Slegs antwoord van $x = 1$: gee 1/4 punte</i> If the learner writes $2x - x = 1$ Breakdown: 0/4 marks <i>As die leerder $2x - x = 1$ skryf</i> <i>Ontleding: 0/4 punte</i>	✓std vorm/stand vorm ✓factors/fakt ✓$x = 1$ ✓$2^x \neq -1$ (4)
2.3	$(x + y)^2 = \left(\frac{3 - \sqrt{a}}{\sqrt{2}} + \frac{4 + \sqrt{a}}{\sqrt{2}} \right)^2$ $= \left(\frac{7}{\sqrt{2}} \right)^2$ $= \frac{49}{2}$ $= 24\frac{1}{2}$ OR/OF $(x + y)^2 = x^2 + 2xy + y^2$ $= \left(\frac{3 - \sqrt{a}}{\sqrt{2}} \right)^2 + 2 \left(\frac{3 - \sqrt{a}}{\sqrt{2}} \right) \left(\frac{4 + \sqrt{a}}{\sqrt{2}} \right) + \left(\frac{4 + \sqrt{a}}{\sqrt{2}} \right)^2$ $= \left(\frac{9 - 6\sqrt{a} + a}{2} \right) + 2 \left(\frac{12 - \sqrt{a} - a}{2} \right) + \left(\frac{16 + 8\sqrt{a} + a}{2} \right)$ $= \left(\frac{25 + 2\sqrt{a} + 2a}{2} \right) + (12 - \sqrt{a} - a)$ $= \frac{25}{2} + \sqrt{a} + a + 12 - \sqrt{a} - a$ $= 24\frac{1}{2}$	✓substitution/verv. ✓simplification/vereenv. ✓answer/antw. ✓substitution/verv. ✓simplification/vereenv. ✓answer/antw. (3)
2.4	$10^{\frac{1}{12}} \cdot \sqrt[6]{64 \cdot 10} \cdot \sqrt[4]{81 \cdot 10} \cdot \sqrt{4 \cdot 10}$ $= 10^{\frac{1}{12}} \cdot \sqrt[6]{2^6 \cdot 10} \cdot \sqrt[4]{3^4 \cdot 10} \cdot \sqrt{2^2 \cdot 10}$ $= 10^{\frac{1}{12}} \cdot 2^{\frac{6}{6}} \cdot 10^{\frac{1}{6}} \cdot 3^{\frac{4}{4}} \cdot 10^{\frac{1}{4}} \cdot 2^{\frac{2}{2}} \cdot 10^{\frac{1}{2}}$ $= 2 \times 3 \times 2 \times 10^{\frac{12}{12}}$ $= 120$	✓split the surd/ skei wortel ✓rational exponents/ rasionele eksp ✓$10^{\frac{12}{12}}$ ✓simplification/vereenv. (4)

[18]

QUESTION/VRAAG 3

3.1.1	$ \begin{array}{ccccc} 12 & & 17 & & 22 \\ & \searrow & \nearrow & \searrow & \nearrow \\ & 5 & & 5 & \\ T_n = 5n + 7 \end{array} $	✓ $5n$ ✓ 7 (2)
3.1.2	$ \begin{aligned} T_{12} &= 5(12) + 7 \\ &= 67 \end{aligned} $	✓ subst/verv ✓ answer/antw (2)
3.1.3	$ \begin{aligned} 5n + 7 &= 172 \\ 5n &= 165 \\ n &= 33 \end{aligned} $	✓ $5n + 7 = 172$ ✓ answer/antw (2)
3.2	$ \begin{array}{ccccccc} 3 & & x & & y & & 30 \\ & \searrow & \nearrow & \searrow & \nearrow & \searrow & \nearrow \\ & x-3 & & y-x & & y-30 & \end{array} $ $ \begin{aligned} x-3 &= y-x \\ y &= 2x-3 \end{aligned} $ $ \begin{aligned} x-3 &= 30-y \\ x-3 &= 30-2x+3 \\ 3x &= 36 & \textbf{OR/OF} \\ x &= 12 \\ y &= 21 \end{aligned} $ $ \begin{aligned} 30-y &= y-x \\ 30+x &= 2y \\ 30+x &= 2(2x-3) \\ 36 &= 3x \\ 12 &= x \\ y &= 21 \end{aligned} $	✓ $x-3 = y-x$ ✓ $30-y = y-x$ ✓ equating/verg. ✓ $x = 12$ $y = 21$ (4) [10]

QUESTION/VRAAG 4

4.1	$ \begin{array}{ccccccc} 244 & & 193 & & 148 & & 109 \\ & \diagdown & / & \diagdown & / & \diagdown & / \\ & -51 & & -45 & & -39 & \\ & & \diagup & \diagup & \diagdown & \diagdown & \\ & & 6 & & 6 & & \end{array} $ $T_5 = 76$ NOTE/LET WEL: Answer only: 2/2 marks Slegs antwoord: 2/2 punte	✓ calc. differences/berekn verskille ✓ answer/antw. (2)
4.2	$ \begin{aligned} 2a &= 6 \\ a &= 3 \\ 3a + b &= -51 \\ 3(3) + b &= -51 \\ b &= -60 \\ a + b + c &= 244 \\ 3 + -60 + c &= 244 \\ c &= 301 \\ T_n &= 3n^2 - 60n + 301 \end{aligned} $	✓ $a = 3$ ✓ $b = -60$ ✓ $c = 301$ ✓ $T_n = 3n^2 - 60n + 301$ (4)
4.3	$ \begin{aligned} 3n^2 - 60n + 301 &= 508 \\ 3n^2 - 60n - 207 &= 0 \\ n^2 - 20n - 69 &= 0 \\ (n + 3)(n - 23) &= 0 \\ n &= 23 \text{ or } n \neq -3 \end{aligned} $	✓ equating/verg. ✓ std form/stand vorm ✓ factorisation/fakt. ✓ $n = 23$ (4)
4.4	$ \begin{aligned} T_n &= a + (n-1)d \\ 453 &= -51 + (n-1)6 \\ 453 &= -57 + 6n \\ 510 &= 6n \\ n &= 85 \\ &\text{between } T_{85} \text{ and } T_{86} \\ &\text{tussen } T_{85} \text{ en } T_{86} \end{aligned} $ OR/OF $ \begin{aligned} T_{n+1} - T_n &= 453 \\ 3(n+1)^2 - 60(n+1) + 301 - (3n^2 - 60n + 301) &= 453 \\ 3n^2 + 6n + 3 - 60n - 60 - 3n^2 + 60n &= 453 \\ 6n &= 510 \\ n &= 85 \\ &\text{between } T_{85} \text{ and } T_{86} \\ &\text{tussen } T_{85} \text{ en } T_{86} \end{aligned} $	✓ $453 = -57 + 6n$ ✓ $n = 85$ ✓ between T_{85} and T_{86} tussen T_{85} en T_{86} (3) ✓ $3(n+1)^2 - 60(n+1) + 301 - (3n^2 - 60n + 301) = 453$ ✓ $n = 85$ ✓ between T_{85} and T_{86} tussen T_{85} en T_{86} (3)

4.5	$T_n = 3n^2 - 60n + 301$ $= 3(n-10)^2 + 1$ $(n-10)^2 \geq 0$ for/vir $n \in \mathbb{N}$ $3(n-10)^2 \geq 0$ $3(n-10)^2 + 1 > 0$ All terms in the pattern are positive/ <i>al die terme in die patroon is positief</i> OR/OF $T_n = 3n^2 - 60n + 301$ $= 3(n-10)^2 + 1$ T is a minimum valued function with minimum value 1 Range of T: $y \geq 1$ All terms in the pattern are positive. <i>T is funksie met minimum waarde van 1</i> <i>Waardeversameling van T; $y \geq 1$</i> <i>al die terme in die patroon is positief</i>	$\checkmark\checkmark T_n = 3(n-10)^2 + 1$ $\checkmark\checkmark$ argument (4) $\checkmark\checkmark T_n = 3(n-10)^2 + 1$ $\checkmark\checkmark$ argument (4) [17]
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QUESTION/VRAAG 5

5.1	$f(-3) = \frac{-3}{-3+2} + 1$ $= 4$	$\checkmark$ answer/antw. (1)
5.2	$4 = 2^{-x} - 4$ $8 = 2^{-x}$ $2^3 = 2^{-x}$ $x = -3$	$\checkmark 4 = 2^{-x} - 4$ $\checkmark$ answer /antw. (2)
5.3	$x = -2$ $y = 1$	$\checkmark x = -2$ $\checkmark y = 1$ (2)
5.4	$y > -4$ OR/OF $y \in (-4 ; \infty)$	$\checkmark$ answer/antw. (1) $\checkmark$ answer/antw. (1)

5.5	y-intercept/<i>afsnit</i>: $y = \frac{-3}{0+2} + 1$ $= \frac{-1}{2}$ y-intercept/<i>afsnit</i> is $\left(0 ; -\frac{1}{2}\right)$ x-intercept/<i>afsnit</i>: $0 = \frac{-3}{x+2} + 1$ $-1 = \frac{-3}{x+2}$ $-x - 2 = -3$ $-x = -1$ $x = 1$ x-intercept/<i>afsnit</i> is $(1 ; 0)$	✓ subst/<i>verv</i> $x = 0$ ✓ $y = \frac{-1}{2}$ ✓ subst/<i>verv</i> $y = 0$ ✓ simplification/<i>vereenv.</i> ✓ $x = 1$ (5)
5.6	$y = -x + c$ $1 = -(-2) + c$ $-1 = c$ $y = -x - 1$ OR/OF $y - 1 = -(x - (-2))$ $y = -x - 2 + 1$ $y = -x - 1$	✓ subst/<i>verv</i> ✓ answer/<i>antw.</i> (2) ✓ subst/<i>verv</i> ✓ answer/<i>antw.</i> (2)

5.7		f ✓ asympt/asimpt ✓ both pieces of / beide stukke van f ✓ x and/en y intercepts / afsnitte g ✓ asymptote/asimpt ✓ x-intercept/afsnit $(-2 ; 0)$ ✓ y-intercept/afsnit $(0 ; -3)$ (6)
5.8	$x \leq -3$ or $-2 < x \leq -1$ OR/OF $x \in (-\infty ; -3) \cup (-2 ; -1]$	✓ $x \leq -3$ ✓ $-2 < x \leq -1$ (2) ✓ $(-\infty ; -3)$ ✓ $(-2 ; -1]$ (2) [21]

QUESTION/VRAAG 6

6.1	$0 = -x^2 - x + 6$ $x^2 + x - 6 = 0$ $(x + 3)(x - 2) = 0$ $x = -3$ or / of $x = 2$ $B(-3 ; 0)$ and $C(2 ; 0)$	$\checkmark y = 0$ $\checkmark$ standard form/vorm $\checkmark$ factors/faktore $\checkmark$ both answers/beide antw (4)
6.2	$x = \frac{-b}{2a}$ $x = \frac{-(-1)}{2(-1)}$ $= -\frac{1}{2}$ OR/ OF $x = \frac{x_1 + x_2}{2}$ $= \frac{(-3) + (2)}{2}$ $= -\frac{1}{2}$	$\checkmark$ method/metode $\checkmark$ answer/antw. $\checkmark$ method/metode $\checkmark$ answer/antw (2)
6.3	$f\left(-\frac{1}{2}\right)$ $= -\left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right) + 6$ $= 6\frac{1}{4}$ $TP / DP \left(-\frac{1}{2}; 6\frac{1}{4}\right)$ Range/waardeversameling $y \in \left(-\infty ; 6\frac{1}{4}\right]$ OR/OF $y \leq 6\frac{1}{4}$	$\checkmark$ y value of TP/ waarde van DP $\checkmark \checkmark$ Answer/antw. (3)
6.4	$D(0 ; 6)$ $m_{AD} = \frac{6 - 4}{0 - (-2)}$ $= 1$ Equation of/vergelyking van g: $y = x + 6$	$\checkmark$ coordinates/koördinate D $\checkmark$ gradient. $\checkmark$ answer/antw (3)

6.5	Average/Gemid. gradient = gradient of/van g = 1	✓ answer/antw. (1)
6.6	$f(x) = -\left(x + \frac{1}{2}\right)^2 + \frac{25}{4}$ $h(x) = \left(x + \frac{1}{2} - 3\right)^2 - \frac{25}{4}$ $h(x) = \left(x - \frac{5}{2}\right)^2 - \frac{25}{4}$ OR/OF $f(x) = -x^2 - x + 6$ $h(x) = (x - 3)^2 + (x - 3) - 6$ $h(x) = x^2 - 5x$ $h(x) = \left(x - \frac{5}{2}\right)^2 - \frac{25}{4}$	$✓ f(x) = -\left(x + \frac{1}{2}\right)^2 + \frac{25}{4}$ $✓ \left(x - \frac{5}{2}\right)^2$ $✓ -\frac{25}{4}$ (3) $✓ h(x) = (x - 3)^2 + (x - 3) - 6$ $✓ \left(x - \frac{5}{2}\right)^2$ $✓ -\frac{25}{4}$ (3)
6.7	$-3 < x < 2$ OR/OF $x \in (-3 ; 2)$	$✓✓$ answer/antw. (2) $✓✓$ answer/antw. (2)
6.8	$r = -2$ By symmetry/deur simmetrie $p = 1$ $p - r = 3$ OR/OF $-x^2 - x + 6 = 4$ $-x^2 - x + 2 = 0$ $x^2 + x - 2 = 0$ $(x + 2)(x - 1) = 0$ $x = -2$ or / of $x = 1$ $r = -2$ $p = 1$ $p - r = 3$	$✓ r = -2$ $✓✓ p = 1$ $✓$ answer/antw. (4) $✓ r = -2$ $✓✓ p = 1$ $✓$ answer/antw. (4) [22]

QUESTION/VRAAG 7

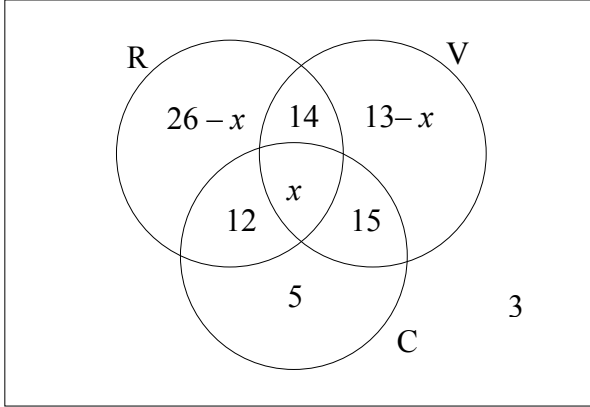
7.1	$A = P(1-i)^n$ $20000 = 80000(1-i)^5$ $0,25 = (1-i)^5$ $\sqrt[5]{0,25} = 1-i$ $i = 1 - \sqrt[5]{0,25}$ $i = 0,24214417$ $i = 24,21\%$	✓ substitution into correct formula/ <i>verv.in korrekte vorm</i> ✓ simplification/ <i>vereenv</i> ✓ answer/ <i>antw.</i> (3)
7.2	$1 + i_{eff} = \left(1 + \frac{i_{nom}}{m}\right)^m$ $1 + i_{eff} = \left(1 + \frac{0,05}{4}\right)^4$ $i_{eff} = 0,050945336...$ Effective rate = 5,09 % p.a.	✓ vorm/ <i>vorm</i> ✓ subst/ <i>verv</i> ✓ answer/ <i>antw.</i> (3)
7.3	$A = P(1+i)^n$ $= 30\,000 \left(1 + \frac{0,12}{12}\right)^{2 \times 12} \left(1 + \frac{0,108}{2}\right)^{4 \times 2}$ $= R\,58\,017,51$	subst/ <i>verv</i> in form/ <i>vorm</i> ✓ $\left(1 + \frac{0,12}{12}\right)^{2 \times 12}$ ✓ $\left(1 + \frac{0,108}{2}\right)^{4 \times 2}$ ✓ answer/ <i>antw.</i> (4)
7.4	$A = 25000 \left(1 + \frac{0,18}{12}\right)^{5 \times 12} - 8000 \left(1 + \frac{0,18}{12}\right)^{3 \times 12} + 4000 \left(1 + \frac{0,18}{12}\right)^{1,5 \times 12}$ $= 25000 \left(1 + \frac{0,18}{12}\right)^{60} - 8000 \left(1 + \frac{0,18}{12}\right)^{36} + 4000 \left(1 + \frac{0,18}{12}\right)^{18}$ $= R\,52636,74$ OR/OF	✓ $\frac{0,18}{12}$ ✓ $25000 \left(1 + \frac{0,18}{12}\right)^{5 \times 12}$ ✓ $- 8000 \left(1 + \frac{0,18}{12}\right)^{3 \times 12}$ ✓ $+ 4000 \left(1 + \frac{0,18}{12}\right)^{18}$ ✓✓ answer/ <i>antw.</i> (6)

$A_1 = 25000 \left(1 + \frac{0,18}{12} \right)^{2 \times 12}$ $= R35737,57$ Amount in the account after the withdrawal: / <i>Bedrag in rekening na onttrekking</i> $R35737,5703 - R8000$ $= R27737,5703$ Amount in the account just before the deposit / <i>bedrag in rekening voor die deposito</i> $A_2 = R27737,5703 \left(1 + \frac{0,18}{12} \right)^{1,5 \times 12}$ $= R36262,45279$ Amount in the account just after the deposit / <i>Bedrag in rekening na onttrekking</i> $R36262,45279 + R4000$ $= R40262,45279$ Amount in the account at the end of 5 years / <i>Bedrag in rekening aan die einde van 5 jaar</i> $= 40262,45279 \left(1 + \frac{0,18}{12} \right)^{1,5 \times 12}$ $= R52636,74$	✓ $\frac{0,18}{12}$ ✓ $25000 \left(1 + \frac{0,18}{12} \right)^{2 \times 12}$ ✓ 27737,57 ✓ $27737,5703 \left(1 + \frac{0,18}{12} \right)^{1,5 \times 12}$ ✓ 40262,45 ✓ answer/antw. (6)
	[16]

QUESTION/VRAAG 8

8.1.1	$\frac{3}{5}$ or 0,6 B $\frac{2}{5}$ or 0,4 R $\frac{2}{4}$ or $\frac{1}{2}$ or 0,5 B $\frac{2}{4}$ or $\frac{1}{2}$ or 0,5 R $\frac{3}{4}$ or B $\frac{1}{4}$ or R (B ; B) (B ; R) (R ; B) (R ; R)	✓branches/takke ✓probabilities/waarskynlikhede ✓outcomes/uitkomst (3)
8.1.2	$P(R, B) = \frac{2}{5} \times \frac{3}{4}$ $= \frac{3}{10}$	✓ $\frac{2}{5} \times \frac{3}{4}$ ✓answer/antwoord (2)
8.2.1	$P(A) = 0,4$ $P(B) = 0,3$ $P(A \text{ or } B) = 0,58$ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,58 = 0,4 + 0,3 - P(A \text{ and } B)$ $P(A \text{ and } B) = 0,12 \neq 0$ Events A and B are not mutually exclusive/Gebeurtenis A en B is nie onderlinguitsluitend nie	✓ $0,58 = 0,4 + 0,3 - P(A \text{ and } B)$ ✓ $P(A \text{ and } B) = 0,12 \neq 0$ ✓Not mutually exclusive/ nie onderling uitsluitend nie (3)
8.2.2	$P(A \text{ and } B) = 0,12$ $P(A) \times P(B) = 0,4 \times 0,3$ $= 0,12$ $\therefore P(A \text{ and } B) = P(A) \times P(B)$ A and B are independent events/is onafhanklik	✓ $P(A) \times P(B) = 0,4 \times 0,3$ ✓ $P(A \text{ and } B) = P(A) \times P(B)$ ✓A and B are independent/is onafhanklik (3)
		[11]

QUESTION/VRAAG 9

9.1		✓ 14 or/of 12 or/of 15 ✓ $26 - x$ ✓ $13 - x$ ✓ 5 ✓ 3 (5)
9.2	$26 - x + 14 + x + 12 + 5 + 15 + 13 - x + 3 = 80$ $88 - 80 = x$ $x = 8$	✓ $26 - x + 14 + x + 12 + 5 + 15 + 13 - x + 3$ ✓ equating to/gelyk aan 80 (2)
9.3	Number who chose Rugby only/ <i>aantal wat net rugby kies</i> $= 26 - 8$ $= 18$	✓ answer/antw. (1)
9.4	$P(\text{At least 2 types of sports /ten minste 2 sportsoorte})$ $= \frac{12 + 14 + 15 + 8}{80}$ $= \frac{49}{80}$ OR/OF $P(\text{at least 2 types of sport/ten minste 2 sportsoorte})$ $= 1 - \frac{18 + 5 + 5 + 3}{80}$ $= 1 - \frac{31}{80}$ $= \frac{49}{80}$	✓ numerator/ <i>Noemer</i> ✓ denominator/ <i>Teller</i> ✓ answer/antw. (3) ✓ $\frac{18 + 5 + 5 + 3}{80}$ ✓ method/ <i>metode</i> ✓ answer/antw. (3) [11]

TOTAL/TOTAAL: 150