

NASIENRIGLYNE

| EKSAMEN | | NASIONALE SENIOR SERTIFIKAAT | |
|----------------|----------------|------------------------------|--|
| GRAAD | 12 | | |
| DATUM | MEI/JUNIE 2025 | | |
| VAK | WISKUNDE | | |
| VRAESTEL | 1 | | |
| PUNTETOTAAL | 150 | | |
| TYDSDUUR (URE) | 3 | | |
| AANTAL BLADSYE | 11 | | |



SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT

FINAAL GOEDGEKEURDE NASIENRIGLYNE

| | |
|-------------------|--|
| VERGADERINGSDATUM | |
| UMALUSI-MODERATOR | |
| HOOFNASIENER | |
| INTERNE MODERATOR | |

LET WEL:

Indien 'n kandidaat 'n vraag twee keer beantwoord, sien slegs die EERSTE poging na.

Voortgaande akkuraatheid geld in al die aspekte van die nasiengids tensy anders gespesifiseer.

VRAAG 1

| | | |
|-------------|--|---|
| 1.1.1 | $(x - 7)(x - 2) = 0$ $x = 7$ or $x = 2$ | ✓ Faktore = 0 ✓ Antwoorde (2) |
| 1.1.2 | $-x^2 - 8x - 4 = 0$ OR $x^2 + 8x + 4 = 0$ $x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(-1)(-4)}}{2(-1)}$ $x = -4 \pm 2\sqrt{3}$ $x = -7,46$ of $x = -0,54$ | ✓ Standaard vorm ✓ Vervang in formule ✓✓ Antwoorde (4) |
| 1.1.3 | $x^2 + 3x - 40 < 0$ $(x + 8)(x - 5) < 0$ $-8 < x < 5$ | ✓ Standaard vorm ✓ Ongelykheid korrek ✓ Getalle korrek (3) |
| 1.2 | $y = 2x - 2$ $x(2x - 2) = 4$ $2x^2 - 2x - 4 = 0$ $x^2 - x - 2 = 0$ $(x - 2)(x + 1) = 0$ $x = 2$ or $x = -1$ $y = 2$ or $y = -4$ | ✓ $y = 2x - 2$ ✓ Vervanging ✓ Standaard vorm ✓ x -antwoorde ✓ y -antwoorde (5) |
| 1.3 | Beperking: $2 - x \geq 0; x \leq 2$ $9(x + 2) = (2 - x)^2$ $9x + 18 = 4 - 4x + x^2$ $x^2 - 13x - 14 = 0$ $(x + 1)(x - 14) = 0$ $x = -1$ | ✓ Kwadreer beide ✓ Vereenvoudig ✓ Standaard vorm ✓ Faktore ✓ Antwoord/ keuse (5) |
| 1.4 | $2^{-x} < 2^3$ $-x < 3$ $x > -3$ | ✓✓ Eksponente ✓ Antwoord (3) |
| [22] | | |

VRAAG 2

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|-------------|--|--|
| 2.1 | $T_9 = ar^8 = 0,1875$ $T_4 = ar^3 = 6$ $\therefore r^5 = \frac{1}{32}$ $r = \frac{1}{2} \text{ en } a = 48$ $48; 24; 12; \dots$ | <ul style="list-style-type: none"> ✓ $T_9 = ar^8$ ✓ $T_4 = ar^3$ ✓ $r^5 = \frac{1}{32}$ ✓ a en r ✓ Ry <p style="text-align: right;">(5)</p> |
| 2.2 | $100 + 104 + 108 + \dots + 300$ $300 = 100 + (n - 1)4$ $4n = 204; \quad n = 51$ $S_{51} = \frac{51}{2}(100 + 300)$ $= 10200$ <p style="text-align: center;">OF</p> $S_{51} = \frac{51}{2}(2(100) + 50(4))$ $= 10200$ | <ul style="list-style-type: none"> ✓ Ry ✓ Vervang in formule ✓ $n = 51$ ✓ Vervang in formule ✓ Antwoord <p style="text-align: right;">(5)</p> |
| 2.3 | $r = \frac{m}{8}$ $S_{\infty} = \frac{8}{1 - \frac{m}{8}} = 12$ $8 = 12\left(1 - \frac{m}{8}\right)$ $8 = 12 - \frac{3m}{2}$ $8 = 3m$ $m = \frac{8}{3}$ $r = \frac{8}{3} \times \frac{1}{8} = \frac{1}{3}$ | <ul style="list-style-type: none"> ✓ $r = \frac{m}{8}$ ✓ Korrek formule met korrekte vervanging ✓ = 12 ✓ Vereenvoudig ✓ m ✓ Antwoord <p style="text-align: right;">(6)</p> |
| [16] | | |

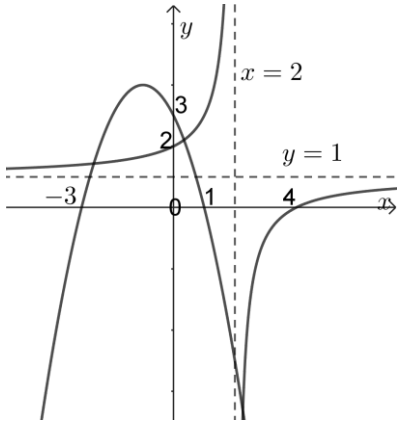
VRAAG 3

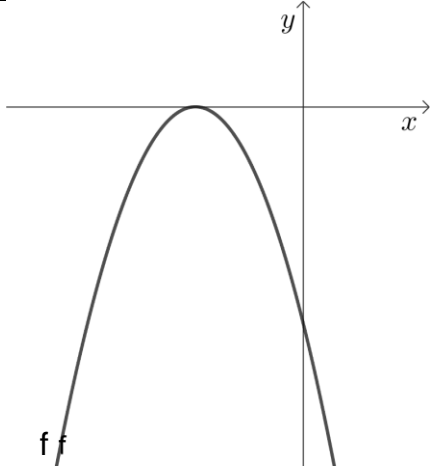
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|-----|---|---|
| 3.1 | Eerste verskil : 1; 3; 5; 7; 9 Volgende twee terme: 4 en 13 | ✓ Eerste verskil ✓✓ 4 en 13 (3) |
| 3.2 | $2a = 2; a = 1$ $3 + b = 1; b = -2$ $1 - 2 + c = -12; c = -11$ $T_n = n^2 - 2n - 11$ | ✓✓✓ a, b en c ✓ T_n (4) |
| 3.3 | $D_n = -1 + 2n$ | ✓✓ Antwoord (2) |
| 3.4 | $D_{60} = -1 + 2(60) = 119$ OF $(61)^2 - 2(61) - 11 - (60)^2 + 2(60) + 11$ $= 119$ | ✓✓ $n = 60$ ✓ Antwoord (3) |
| | | [12] |

VRAAG 4

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|-------------|---|--|
| 4.1 | $150000 = P \left(1 - \frac{14,5}{100}\right)^5$ $P = 150000 / \left(1 - \frac{14,5}{100}\right)^5$ $P = R328\,292$ | <ul style="list-style-type: none"> ✓ Vergelyking korrek ✓ Berekeninge ✓ Antwoord <p style="text-align: right;">(3)</p> |
| 4.2.1 | <p>Kagiso:</p> $3000 \left(\frac{\left(1 + \frac{10}{1200}\right)^{120} - 1}{\frac{10}{1200}} \right)$ $= R614\,534,94$ <p>Abel</p> $100000(1,1)^5 \left(1 + \frac{10}{400}\right)^{20} + 240000 \left(1 + \frac{10}{400}\right)^{20}$ $= R263\,900,82 + R393\,267,95$ $= R657\,168,77 \text{ (sente mag verskil)}$ <p>Abel se belegging was die mees winsgewende.</p> | <ul style="list-style-type: none"> ✓ Korrek n en r ✓ Korrek vervanging in korrek formule ✓ Antwoord Kagiso ✓ Korrekte formule ✓ Eksponent 20 ✓ $+ 24000 \left(1 + \frac{10}{400}\right)^{16}$ ✓ Antwoord ✓ Antwoord <p style="text-align: right;">(8)</p> |
| 4.2.3 | $600000 = 20\,000 \frac{1 - \left(1 + \frac{10}{400}\right)^{-n}}{\frac{10}{400}}$ $\left(1 + \frac{10}{400}\right)^{-n} = \frac{1}{4}$ $-n = \log_{\left(1 + \frac{10}{400}\right)} \frac{1}{4}$ $n = 56,14 \text{ kwartale}$ $= 14,04 \text{ jaar}$ | <ul style="list-style-type: none"> ✓ Korrek formule ✓ $\frac{5}{8}$ ✓ Omskakeling na log ✓ Kwartale ✓ Jaar <p style="text-align: right;">(5)</p> |
| [16] | | |

VRAAG 5

| | | |
|-------|--|--|
| 5.1.1 | $(-1; 4)$ | ✓ Antwoord (1) |
| 5.1.2 | $y = -\frac{2}{-2} + 1 = 2$ $\frac{-2}{x-2} = -1$ $-2 = -x + 2$ $x = 4$ | ✓ y-afs ✓ Berekeninge ✓ x-afs (3) |
| 5.1.3 | $-(x + 1)^2 + 4 = 0$ $(x + 1) = \pm 2$ $x = 1 \text{ of } x = -3$ <p style="text-align: center;">OF</p> $-x^2 - 2x - 1 + 4 = 0$ $x^2 + 2x - 3 = 0$ $(x - 1)(x + 3) = 0$ $x = 1 \text{ of } x = -3$ | ✓ Stel =0 ✓ ± 2 ✓✓ x-afsnitte ✓ Stel = 0 ✓ formule ✓✓ x-afsnitte (4) |
| 5.1.4 |  | ✓ Parabool ✓ Hiperbool vorm ✓ Afsnitte ✓✓ Asimptote (5) |
| 5.1.5 | $k(x) = -(x - 4)^2 + 2$ | ✓✓ Antwoord (2) |

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|-------------|---|--|
| 5.2 |  | <ul style="list-style-type: none"> ✓ DP op x-axis ✓ DP negatief x ✓ Negatief y-afs ✓ Vorm <p style="text-align: right;">(4)</p> |
| [19] | | |

VRAAG 6

| | | |
|-------------|--|--|
| 6.1 | $-2 = \log_a 4$ $a^{-2} = 4$ $a = \frac{1}{2}$ | <ul style="list-style-type: none"> ✓ Vervang (4; -2) ✓ Eksponent ✓ Antwoord <p style="text-align: right;">(3)</p> |
| 6.2 | $g(x) = \log_2 x$ | <ul style="list-style-type: none"> ✓✓ Antwoord <p style="text-align: right;">(2)</p> |
| 6.3 | $f^{-1}(x) = \left(\frac{1}{2}\right)^x$ | <ul style="list-style-type: none"> ✓✓ Antwoord <p style="text-align: right;">(2)</p> |
| 6.4 | $x > 0$ | <ul style="list-style-type: none"> ✓✓ Antwoord <p style="text-align: right;">(2)</p> |
| 6.5 | $0 < x \leq 4$ | <ul style="list-style-type: none"> ✓✓✓ Antwoord <p style="text-align: right;">(3)</p> |
| [12] | | |

VRAAG 7 Penaliseer slegs EEN keer in vraag vir notasie

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|-------|--|---|
| 7.1 | $f(x) = x^2 - 4$ $f(x+h) = (x+h)^2 - 4$ $= x^2 + 2xh + h^2 - 4$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - 4 - x^2 + 4}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{h(2x + h)}{h}$ $f'(x) = \lim_{h \rightarrow 0} (2x + h)$ $f'(x) = 2x$ | <p>✓ $f(x+h)$</p> <p>✓ Korrekte vervanging</p> <p>✓ Vereenvoudig</p> <p>✓ $h(2x+h)$</p> <p>✓ $2x$</p> <p>(5)</p> |
| 7.2.1 | $f(x) = 4x^2 - \frac{1}{2}x^{-2}$ $f'(x) = 8x + x^{-3}$ | <p>✓ Vereenvoudig</p> <p>✓ $8x$</p> <p>✓ x^{-3}</p> <p>(3)</p> |
| 7.2.2 | $f(x) = x + 4\sqrt{x} + 4$ $= x + 4x^{\frac{1}{2}} + 4$ $f'(x) = 1 + 2x^{-\frac{1}{2}}$ | <p>✓ Vereenvoudig hakie</p> <p>✓ Eksponent</p> <p>✓ 1</p> <p>✓ $2x^{-\frac{1}{2}}$</p> <p>(4)</p> |
| 7.3.1 | <p>$EC = 5x$ Terorie van Phytagoras</p> $5x + 3x + 4x + 2y = 100$ $2y - 100 - 12x$ $y = 50 - 6x$ | <p>✓ EC</p> <p>✓ Omtrek = 100</p> <p>✓ $y = 50 - 6x$</p> <p>(3)</p> |

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|-------------|---|--|
| 7.3.2 | $\text{Area driehoek} = \frac{1}{2} \cdot 4x \cdot 3x$ $= 6x^2$ $\text{Area reghoek} = 5x(50 - 6x)$ $= 250x - 30x^2$ $\text{Totale oppervlakte} = 250x - 24x^2$ | ✓ Driehoek formule ✓ Oppervl driehoek ✓ Oppervl reghoek (3) |
| 7.3.3 | $A'(x) = 250 - 48x = 0$ $x = \frac{250}{48} = \frac{125}{24} = 5,21$ | ✓✓ Differensieer=0 ✓ Antwoord (3) |
| [21] | | |

VRAAG 8

| | | |
|-------------|---|---|
| 8.1 | $(x + 5)(x + 2)(x - 1) = 0$ $(-5;0), (-2;0), (1;0)$ | ✓ Faktore ✓✓✓ Koördinate (4) |
| 8.2 | $(0; -10)$ | ✓ (1) |
| 8.3 | $x = 0$ en $y = -10$ $m = f'(0) = 3$ $y + 10 = 3x$ $y = 3x - 10$ | ✓✓ x en y waardes ✓ $m = f'(0)$ ✓ $m=3$ raaklyn (4) |
| 8.4 | $f(x) = x^3 + 6x^2 + 3x - 10$ $f'(x) = 3x^2 + 12x + 3$ $f''(x) = 6x + 12 = 0$ $x = -2$ $y = 0$ $(-2; 0)$ | ✓ Vergelyking ✓ Differensiasie ✓ Differensiasie =0 ✓ Antwoord x ✓ Antwoord y (5) |
| 8.5 | y -waarde op raaklyn wanneer $x = -2$ $y = 3(-2) - 10 = -16$ Afstand = 16 | ✓✓ Bereken y ✓ Afstand (3) |
| [17] | | |



VRAAG 9

| | | |
|-------------|---|---|
| 9.1.1 | $P(B) = 0,48$ Vir onderling uitsluitend $P(A \text{ of } B) = P(A) + P(B)$ $P(A \text{ of } B) = 0,4 + 0,48 = 0,88$ | ✓ $P(B)$ ✓ Formule ✓ Antwoord (3) |
| 9.1.2 | As A en B onafhanklik is, sal $P(A \text{ en } B) = P(A) \cdot P(B)$ $P(A \text{ en } B) = P(A) \cdot P(B) = 0,4 \times 0,48 = 0,192$ $P(A \cup B) = P(A) + P(B) - P(A \text{ en } B)$ $p(A \cup B) = 0,4 + 0,48 - 0,192$ $= 0,69 = \frac{86}{125}$ | ✓ Formule ✓ Bereken $P(A) \cdot P(B)$ ✓ Formule ✓ Vervang ✓ Antwoord (5) |
| 9.2.1 | $= 7 \times 6 \times 5$ $= 210$ | ✓ $7 \times 6 \times 5$ ✓ Antwoord (2) |
| 9.2.2 | Eerste syfer: 4 maniere. Tweede syfer: 7 maniere. Laaste syfer 2 maniere. Maar 300 is ingesluit, dus $4 \times 7 \times 2 - 1 = 55$ Waarskynlikheid $= \frac{55}{210} = \frac{11}{42} = 0,26$ | ✓ 1'ste syfer ✓ 2'de syfer ✓ 3'de syfer ✓ Vermenigvuldig ✓ Waarskynlikheid (5) |
| [15] | | |

GROOTTOTAAL: [150]