



**GAUTENG PROVINCE**  
EDUCATION  
REPUBLIC OF SOUTH AFRICA

# **VOORBEREIDENDE EKSAMEN**

**2022**

## **NASIENRIGLYNE**

|                                      |
|--------------------------------------|
| <b>WISKUNDE (VRAESTEL 1) (10611)</b> |
|--------------------------------------|

23 bladsye

## **INSTRUKSIES EN INLIGTING**

A - Akkuraatheid

C.A. - Kontinue Akkuraatheid

### **NOTA:**

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, merk slegs die EERSTE poging.
- Indien 'n kandidaat 'n antwoord doodgetrek het en nie die vraag weer gedoen het nie, merk die doodgetrekte poging.
- Volgehoue akkuraatheid geld vir ALLE aspekte van die nasienriglyne.
- Dit is onaanvaarbaar vir kandidate om waardes/antwoorde aan te neem om probleme op te los.

## VRAAG 1

|     |       |                                                                                                                                                                                                                                                                                                                                                   |                                                                              |     |
|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----|
| 1.1 | 1.1.1 | $2x(x^2 - 1) = 0$<br>$2x(x - 1)(x + 1) = 0$<br>$x = 0$ of $x = 1$ of $x = -1$<br><b>NOTA: Enige ander geldige metode.</b>                                                                                                                                                                                                                         | ✓ faktore<br>✓ antwoorde                                                     | (2) |
|     |       |                                                                                                                                                                                                                                                                                                                                                   |                                                                              |     |
|     | 1.1.2 | $x - 6 + \frac{2}{x} = 0$<br>$x^2 - 6x + 2 = 0$<br>$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$<br>$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(2)}}{2(1)}$<br>$x = \frac{6 \pm \sqrt{28}}{2}$<br>$\therefore x = 5,65 \dots$ of $\dots x = 0,35$<br><b>NOTA: Penaliseer vir afronding, SLEGS in hierdie vraag.</b><br><b>Enige ander geldige metode.</b> | ✓ standaardvorm<br><br>✓ substitusie in korrekte formule<br><br>✓✓ antwoorde | (4) |
|     |       |                                                                                                                                                                                                                                                                                                                                                   |                                                                              |     |
|     | 1.1.3 | $(x - 1)(x + 4) \geq 6$<br>$\therefore x^2 + 3x - 4 \geq 6$<br>$\therefore x^2 + 3x - 10 \geq 0$<br>$\therefore (x + 5)(x - 2) \geq 0$<br>$\therefore x \leq -5$ OF $x \geq 2$<br>                                                                             | ✓ standaardvorm<br>✓ faktore<br>✓ antwoorde                                  | (3) |



|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1.2 | $x - 2y = 1$ en $2x^2 - xy - 5y - 3y^2 - 2 = 0$<br>$x = 2y + 1 \quad \dots(1)$<br>$2x^2 - xy - 5y - 3y^2 - 2 = 0 \quad \dots(2)$<br>Vervang (1) in (2):<br>$2(2y + 1)^2 - (2y + 1)y - 5y - 3y^2 - 2 = 0$<br>$3y^2 + 2y = 0$<br>$y(3y + 2) = 0$<br>$y = 0$ of $y = -\frac{2}{3}$<br>$x = 1$ of $x = -\frac{1}{3}$<br><br><b>NOTA: Enige ander geldige metode.</b>                                                                                                                          | ✓ vergelyking vir $x$<br><br><br>✓ standaardvorm<br><br>✓ y- waardes<br><br>✓ x- waardes                                                                          | (4) |
| 1.3 | $2^{x+1} + 2^x = 3^{y+2} - 3^y$<br>$2^x(2^1 + 1) = 3^y(3^2 - 1)$<br>$2^x(3) = 3^y(8)$<br>$\therefore \frac{2^x}{8} = \frac{3^y}{3}$<br>$\therefore \frac{2^x}{2^3} = \frac{3^y}{3}$<br>$\therefore 2^{x-3} = 3^{y-1}$<br>$\therefore x - 3 = 0 \dots en \dots y - 1 = 0$<br>$\therefore x = 3 \dots en \dots y = 1$<br><br><b>OF</b><br><br>$2^{x+1} + 2^x = 3^{y+2} - 3^y$<br>$2^x(2^1 + 1) = 3^y(3^2 - 1)$<br>$2^x(3) = 3^y(8)$<br>$2^x(3) = 3^y(2^3)$<br>$\therefore x = 3$ en $y = 1$ | ✓ faktoreer<br><br><br>✓ vereenvoudig, een mag aan elke kant<br><br>✓ antwoorde<br><br><br>✓ faktoreer<br><br>✓ vereenvoudig, dieselfde grondtalle<br>✓ antwoorde | (3) |





## VRAAG 2

|      |       |                                                                                                                                                                                                                                                                                                                |                                                                                      |     |
|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----|
| 2.1  | 2.1.1 | $  \begin{array}{cccc}  20 & 12 & 10 & 14 \\  \vee & & \vee & \vee \\  -8 & & -2 & 4 \\  & \vee & & \vee \\  & 6 & & 6  \end{array}  $ $  \begin{array}{lll}  2a = 6 & 3a + b = -8 & a + b + c = 20 \\  a = 3 & 3(3) + b = -8 & 3 - 17 + c = 20 \\  & b = -17 & c = 34  \end{array}  $ $T_n = 3n^2 - 17n + 34$ | ✓ 2 <sup>de</sup> verskil<br><br>✓ $a = 3$<br>✓ $b = -17$<br>✓ $c = 34$              | (4) |
|      | 2.1.2 | $T_n = a + (n-1)d$ $148 = -8 + (n-1)(6)$ $148 = 6n - 14$ $n = 27$ Tussen 27 <sup>ste</sup> en 28 <sup>ste</sup> terme.                                                                                                                                                                                         | ✓ substitusie in korrekte formule<br><br>✓ waarde van $n$<br>✓ gevoltrekking         | (3) |
|      | 2.1.3 | $S_n = \frac{n}{2}[2a + (n-1)d]$ $\frac{n}{2}[2(-8) + (n-1)6] > 10140$ $3n^2 - 11n > 10140$ $3n^2 - 11n - 10140 > 0$ $(3n + 169)(n - 60) > 0$ $\therefore n > 60$ $n = 61$                                                                                                                                     | ✓ substitusie<br><br>✓ standaardvorm<br>✓ faktore<br>✓ keuse, $n > 60$<br>✓ antwoord | (5) |
| 2.2  |       | $\sum_{r=1}^5 (r+b) = (1+b) + (2+b) + (3+b) + (4+b) + (5+b)$ $\sum_{r=1}^5 (r+b) = 15 + 5b$ $\therefore \sum_{r=1}^5 (r+b) = 10a$ $\therefore 15 + 5b = 10a$ $\therefore 5b = 10a - 15$ $\therefore b = 2a - 3$                                                                                                | ✓ uitbreiding<br><br>✓ gelyk stel<br><br>✓ antwoord                                  | (3) |
| [15] |       |                                                                                                                                                                                                                                                                                                                |                                                                                      |     |



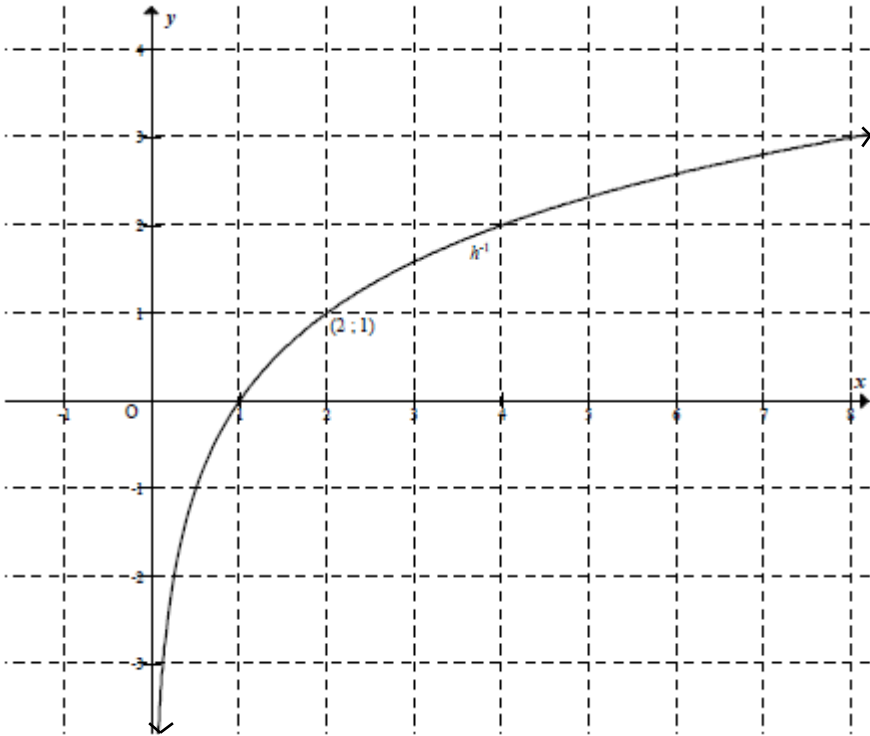
## VRAAG 3

|             |                                                                                                                                                                                                                                |                                                                                                                                      |     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|
| 3.1         | $a = \frac{24}{x}$ $r = \frac{6x}{12} \dots \text{of} \dots \frac{3x^2}{6x} \dots \text{of} \dots \frac{x}{2}$ $S_{\infty} = \frac{a}{1-r}$ $S_{\infty} = \frac{\frac{24}{x}}{1-\frac{x}{2}}$ $S_{\infty} = \frac{48}{2x-x^2}$ | <p>✓ waarde van <math>r</math></p> <p>✓ substitusie in korrekte formule</p> <p>✓ ✓ antwoord</p>                                      | (4) |
| 3.2         | <p>Dit bestaan wanneer:</p> $-1 < \frac{x}{2} < 1 \text{ ie: } -1 < r < 1$ $\therefore -2 < x < 2$ <p><b>NOTA: Slegs antwoord Volpunte</b></p>                                                                                 | <p>✓ <math>-1 &lt; r &lt; 1</math></p> <p>✓ antwoord</p>                                                                             | (2) |
| 3.3         | $r > 1$ $\therefore \frac{x}{2} > 1$ $\therefore x > 2$ <p><b>NOTA: Slegs antwoord Volpunte</b></p>                                                                                                                            | <p>✓ <math>r &gt; 1</math></p> <p>✓ antwoord</p>                                                                                     | (2) |
| 3.4         | $a = \frac{24}{4}$ $\therefore a = 6$ $r = \frac{x}{2} = 2$ $n = 15$ $\therefore S_n = \frac{a(r^n - 1)}{r - 1}$ $\therefore S_{15} = \frac{6(2^{15} - 1)}{2 - 1}$ $\therefore S_{15} = 196602$                                | <p>✓ waarde van <math>a</math></p> <p>✓ waarde van <math>r</math></p> <p>✓ substitusie in die korrekte formule</p> <p>✓ antwoord</p> | (4) |
| <b>[12]</b> |                                                                                                                                                                                                                                |                                                                                                                                      |     |



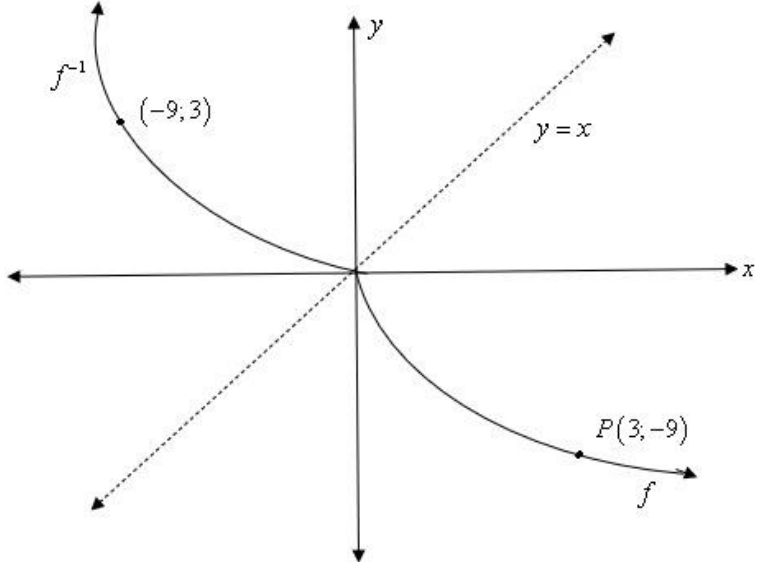
|             |                                                                                                                                                                                           |                                                                                                                          |     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----|
| 4.5         | $k(x) = -g(x)$<br>$\therefore k(x) = -\left(\frac{2}{x-1} + 2\right)$<br>$\therefore k(x) = \frac{-2}{x-1} - 2$                                                                           | ✓ $k(x) = -g(x)$<br><br>✓ antwoord                                                                                       | (2) |
| 4.6         | $x > 1$ of $0 < x < 1$<br><br><b>OF</b><br><br>$x \in (1; \infty)$ or $(0 < x < 1)$<br><br><b>OF</b><br><br>$x > 0$ ; $x \neq 1$<br><br><b>OF</b><br><br>$x \in (0; \infty)$ ; $x \neq 1$ | ✓ antwoord<br>✓ antwoord<br><br>✓ antwoord<br>✓ antwoord<br><br>✓ antwoord<br>✓ antwoord<br><br>✓ antwoord<br>✓ antwoord | (2) |
| 4.7         | $k > 0$                                                                                                                                                                                   | ✓ antwoord                                                                                                               | (1) |
| <b>[14]</b> |                                                                                                                                                                                           |                                                                                                                          |     |

## VRAAG 5

|     |                                                                                     |                                |     |
|-----|-------------------------------------------------------------------------------------|--------------------------------|-----|
| 5.1 | (0;1)                                                                               | ✓ antwoord                     |     |
|     | <b>NOTA: Antwoord MOET as koördinaat gegee word.</b>                                |                                | (1) |
| 5.2 | $a^{-1} = \frac{1}{2}$<br>$\frac{1}{a} = \frac{1}{2}$<br>$a = 2$                    | ✓ vervang punt<br>✓ antwoord   | (2) |
| 5.3 | $2^y = x$<br>$y = \log_2 x$<br><b>NOTA: Slegs antwoord, vol punte.</b>              | ✓ ruil<br>x en y<br>✓ antwoord | (2) |
| 5.4 |  | ✓ vorm<br>✓ x - afsnit         | (2) |
| 5.5 | $x > 0$                                                                             | ✓ antwoord                     | (1) |
| 5.6 | $x > 2$                                                                             | ✓ antwoord                     | (1) |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                           |     |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 5.7         | $g(x) = 100 \cdot 3^x \dots\dots h(x) = 2^x$ $\text{as... } g(x) = h(x)$ $\therefore 100 \cdot 3^x = 2^x$ $\therefore 100 = \frac{2^x}{3^x}$ $\therefore 100 = \left(\frac{2}{3}\right)^x$ $\therefore x = \log_{\frac{2}{3}} 100$ $\therefore x = -11,36$ <p style="text-align: center;"><b>OF</b></p> $2 + x \log 3 = x \cdot \log 2$ $\therefore 2 = x \cdot \log 2 - \log 3$ $\therefore 2 = x \cdot \log \frac{2}{3}$ $\therefore x = \frac{2}{\log \frac{2}{3}}$ $\therefore x = -11,36$ | <p>✓ vereenvoudig</p> <p>✓ <math>x</math> as onderwerp</p> <p>✓ antwoord</p> <p style="text-align: center;"><b>OF</b></p> <p>✓ stel vereenvoudigde kante gelyk</p> <p>✓ <math>x</math> as onderwerp</p> <p>✓ antwoord</p> | (3) |
| <b>[12]</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                           |     |

## VRAAG 6

|             |                                                                                                                                                                         |                                                                                              |     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----|
| 6.1         | $0 \leq x \leq 3$<br><b>OF</b><br>$x \in [0;3]$<br><b>NOTA: Die antwoord kan as aparte ongelykhede geskryf word.</b>                                                    | ✓ kritieke waardes<br>✓ notasie                                                              | (2) |
| 6.2         | Vergelyking van $f$ : $y = -\sqrt{27x}$ vir $x \geq 0$<br>Vergelyking van $f^{-1}$ : $x = -\sqrt{27y}$ vir $y \geq 0$<br>$\therefore y = \frac{x^2}{27}$ vir $x \leq 0$ | ✓ ruil $x$ en $y$<br>✓ beperking van $f^{-1}$<br>✓ vergelyking in $y$<br>✓ beperking van $y$ | (4) |
| 6.3         |                                                                                       | ✓ vorm<br>✓ x-afsnit<br>✓ punt $(-9 ; 3)$                                                    | (3) |
| 6.4         | Refleksie in die $x$ -as                                                                                                                                                | ✓ antwoord                                                                                   | (1) |
| <b>[10]</b> |                                                                                                                                                                         |                                                                                              |     |

## VRAAG 7

**NOTA: Verkeerde formule, STOP om verder te merk, tensy onafhanklike punte toegeken word.**

|       |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                          |     |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 7.1   | $A = P(1+i)^n$ $2x = x(1 + \frac{i}{4})^{24}$ $\therefore (1 + \frac{i}{4})^{24} = 2$ $\therefore 1 + \frac{i}{4} = \sqrt[24]{2}$ $\therefore \frac{i}{4} = 0,0293$ $\therefore i = 0,1172$ <p>Die jaarlikse rentekoers <math>\cong 11,72\%</math></p> <p><b>NOTA: Indien 'n kandidaat spesifieke waardes vir A en P in vervang, ken 'n MAKSIMUM van 4 punte toe.</b></p>        | <p>✓ <math>n = 24</math></p> <p>✓ substitusie</p> <p>✓ vereenvoudig beide kante</p> <p>✓ waarde van <math>i</math></p> <p>✓ antwoord</p> | (5) |
| 7.2.1 | $F_v = P_v (1 + i)^n$ $F_v = 10\,000 (1 + \frac{9,5}{100})^5$ $F_v = 10\,402,15$ <p><b>NOTA: Enige ander geldige metode.</b></p>                                                                                                                                                                                                                                                 | <p>✓ substitusie</p> <p>✓ antwoord</p>                                                                                                   | (2) |
| 7.2.2 | $P_v = \frac{x[1 - (1+i)^{-n}]}{i}$ $\therefore 10\,402,15 = \frac{450[1 - (1,0079)^{-n}]}{0,0079}$ $\therefore [1 - (1,0079)^{-n}] = 0,183$ $\therefore 1 - 0,183 = (1,0079)^{-n}$ $\therefore 0,8169 = (1,0079)^{-n}$ $\therefore -n = \log_{1,0079} 0,8169$ $\therefore -n = -25,7008$ $\therefore n = 26 \text{ maande}$ <p><b>NOTA: Antwoord punt is vir 26 maande.</b></p> | <p>✓ substitusie in die korrekte formule</p> <p>✓ vereenvoudig beide kante</p> <p>✓ korrekte gebruik van logs</p> <p>✓ antwoord</p>      | (4) |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                               |     |
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| 7.2.3       | <p>Balans van lening na 25<sup>ste</sup> paaient</p> <p>= waarde van lening – waarde van annuiteit op daardie tyd</p> $= 10\,402,15(1,0079\dots)^{25} - \frac{450[(1,0079\dots)^{25} - 1]}{0,0079}$ $= 12\,668,89 - 12\,386,53$ $= R282,36$ <p style="text-align: center;"><b>Of</b></p> <p>Na die 25<sup>ste</sup> paaientnet, die oorblywende aantal paaientente = 25,7008 - 25 = 0,7008</p> $\therefore \text{balans} = \frac{450[1 - (1 + \frac{0,095}{12})^{-0,7008}]}{\frac{0,095}{12}}$ $\therefore \text{balans} = R282,36$ | <p>✓ substitusie</p> <p>✓ antwoord</p> <p>✓ substitusie</p> <p>✓ antwoord</p> | (2) |
| <b>[13]</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                               |     |

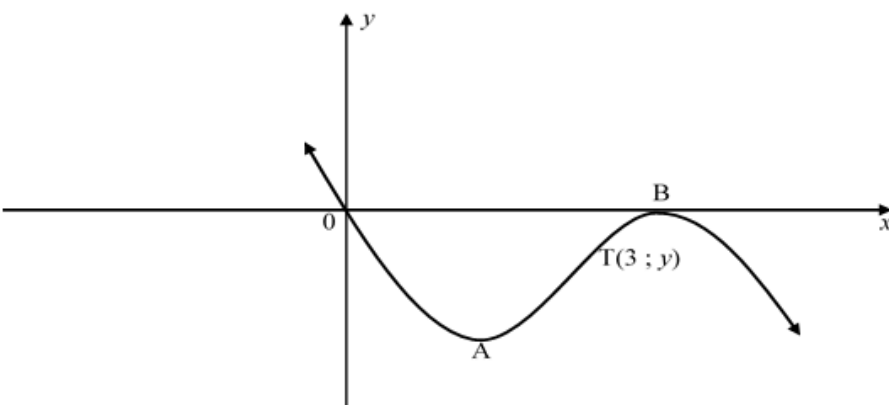
**VRAAG 8**

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                         |     |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----|
| 8.1 | <p><math>f(x) = 3x^2 + 2x</math></p> <p><math>f(x+h) = 3(x+h)^2 + 2(x+h)</math></p> <p><math>f(x+h) = 3x^2 + 6xh + 3h^2 + 2x + 2h</math></p> <p><math>f(x+h) - f(x) = 3x^2 + 6xh + 3h^2 + 2x + 2h - 3x^2 - 2x</math></p> <p><math>= 6xh + 3h^2 + 2h</math></p> <p><math>f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}</math></p> <p><math>= \lim_{h \rightarrow 0} \frac{h(6x + 3h + 2)}{h}</math></p> <p><math>= \lim_{h \rightarrow 0} (6x + 3h + 2)</math></p> <p><math>= 6x + 2</math></p> <p><b>NOTA: Penaliseer 1 punt vir notasie fout.</b></p> | <p>✓ <math>f(x+h)</math></p> <p>✓ <math>f(x+h) - f(x)</math></p> <p>✓ faktoriseer</p> <p>✓ antwoord</p> | (4) |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----|



|     |                                                                                                                                                                                                                                                                                                                                                             |                                                  |     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----|
| 8.2 | $y = 4\sqrt{x} - \frac{8}{\sqrt{x}} + \pi x^3$ $y = 4x^{\frac{1}{2}} - 8x^{-\frac{1}{2}} + \pi x^3$ $\frac{d_y}{d_x} = 2x^{-\frac{1}{2}} + 4x^{-\frac{3}{2}} + 3\pi x^2$ <p><b>NOTA:</b> Aanvaar: <math>\frac{2}{x^{\frac{1}{2}}} + \frac{4}{x^{\frac{3}{2}}} + 3\pi x^2</math></p> <p><b>OF</b></p> $\frac{2}{\sqrt{x}} + \frac{4}{\sqrt{x^3}} + 3\pi x^2$ | <p>✓ verwyder wortels</p> <p>✓ ✓ ✓ antwoorde</p> | (4) |
| 8.3 | Hierdie vraag is uit die vraestel gelaat, MOENIE merk nie                                                                                                                                                                                                                                                                                                   |                                                  | (0) |
|     |                                                                                                                                                                                                                                                                                                                                                             |                                                  | [8] |

## VRAAG 9

|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                           |                                                             |     |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----|
|  |                                                                                                                                                                                                                                                                                                                                                                           |                                                             |     |
| 9.1                                                                                | $h(x) = -[x(x-6)^2]$ $h(x) = -[x^3 - 12x^2 + 36x]$ $h(x) = -x^3 + 12x^2 - 36x$ $\therefore a = 12$ $\therefore b = -36$                                                                                                                                                                                                                                                   | ✓ vervang wortels<br>✓ vereenvoudiging<br>✓ vereenvoudiging | (3) |
| 9.2                                                                                | $h(x) = -x^3 + 12x^2 - 36x$ $h'(x) = -3x^2 + 24x - 36$ $-3x^2 + 24x - 36 = 0$ $-3(x-6)(x-2) = 0$ $\therefore x = 6 \quad \text{or} \quad x = 2$ $\therefore x = 2 \text{ by punt A.}$ $\therefore h(2) = -32$ $\therefore A(2; -32)$ <p><b>NOTA: Antwoord hoef NIE as koördinaat gegee te word nie.</b><br/> <b>Gelykstel aan nul moet nie ge-impliseer word nie.</b></p> | ✓ afgeleide = 0<br><br>✓ keuse van x-waarde<br>✓ y-waarde   | (3) |
| 9.3                                                                                | $h(3) = -(3)^3 + 12(3)^2 - 36(3)$ $h(3) = -27$ <p><b>NOTA: Slegs antwoord, VOLPUNTE.</b></p>                                                                                                                                                                                                                                                                              | ✓ antwoord                                                  | (1) |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                              |      |
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| 9.4 | $h(x) = -x^3 + 12x^2 - 36x$ $h'(x) = -3x^2 + 24x - 36$ $h''(x) = -6x + 24$ $h''(3) = -6(3) + 24$ $h''(3) = 6$ $\therefore h''(3) > 0$ <p><math>\therefore h</math> is konkaaf OP by punt T.</p> <p><b>OF</b></p> $h''(x) = 0$ $-6x + 24 = 0$ $x = 4$ <p>Buigpunt is by <math>x = 4</math><br/>by Punt T, is die grafiek KONKAAF OP</p> <p><b>NOTA:</b><br/><b>Kandisaat moet 'n geldige BEWERKING toon om 'n gevolgtrekking te kan maak, om volpunte te verdien.</b></p> <p><b>Indien slegs die gevolgtrekking gemaak is, word net 1 punt toegeken.</b></p> | <p>✓ <math>h''(x)</math></p> <p>✓ waarde van <math>h''(3)</math></p> <p>✓ gevolgtrekking</p> <p>✓ <math>h''(x)</math></p> <p>✓ buigpunt is by <math>x = 4</math></p> <p>✓ gevolgtrekking</p> | (3)  |
| 9.5 | $h''(x) = -6x + 24$ $\therefore 0 = -6x + 24$ $\therefore 6x = 24$ $\therefore x = 4$ $\therefore h(4) = -16$ <p>Buigpunt: (4 ; -16)</p> <p><b>NOTA: Antwoord hoef nie as 'n koördinaat gegee te word nie.</b></p>                                                                                                                                                                                                                                                                                                                                          | <p>✓ waarde van <math>x</math></p> <p>✓ waarde van <math>y</math></p>                                                                                                                        | (2)  |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                              | [12] |

## VRAAG 10

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                            |     |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 10.1 | <p>Huur                      Aantal kamers verhuur                      Inkomste</p> <p>R500                      72                      R36 000</p> <p>R600                      72 – 2</p> <p>Aantal verhogings: <math>\frac{x-500}{100}</math></p> <p>Aantal kamers verhuur: <math>72 - 2\left(\frac{x-500}{100}\right)</math></p> <p>Inkomste(I) = <math>x\left[72 - \frac{2x}{100} + \frac{1\,000}{100}\right]</math></p> <p><math>= x\left[\frac{7\,200 - 2x + 1\,000}{100}\right]</math></p> <p><math>= x\left[\frac{8\,200 - 2x}{100}\right]</math></p> <p><math>= 82x - \frac{x^2}{50}</math></p> | <p>✓ <math>\frac{x-500}{100}</math></p> <p>✓ <math>72 - 2\left(\frac{x-500}{100}\right)</math></p> <p>✓ substitusie</p> <p>✓ <math>x\left[\frac{7\,200 - 2x + 1\,000}{100}\right]</math></p> <p>✓ <math>= x\left[\frac{8\,200 - 2x}{100}\right]</math></p> | (5) |
| 10.2 | <p><math>I = 82x - \frac{x^2}{50}</math></p> <p><math>I' = 82 - \frac{2x}{50}</math></p> <p><math>82 - \frac{2x}{50} = 0</math></p> <p><math>82 = \frac{2x}{50}</math></p> <p><math>x = R2\,050</math></p> <p><b>NOTA: Gelykstelling aan nul, mag ge-impliseer word.</b></p>                                                                                                                                                                                                                                                                                                                                | <p>✓ afgeleide = 0</p> <p>✓ antwoord</p>                                                                                                                                                                                                                   | (2) |
| [7]  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                            |     |

## VRAAG 11

|      |        |                                                                                                                                                                                                                                    |                                                                        |     |
|------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----|
| 11.1 |        | $P(A \text{ of } B) = P(A) + P(B)$<br>$0,57 = P(A) + 2 P(A)$<br>$\therefore 3P(A) = 0,57$<br>$\therefore P(A) = 0,19$<br>$\therefore P(B) = 2 P(A)$<br>$= 2(0,19)$<br>$P(B) = 0,38$                                                | ✓ substitusie<br><br>✓ waarde van P(A)<br><br>✓ antwoord               | (3) |
| 11.2 | 11.2.1 | Nie Foutief (NF)<br>$\therefore P(NF) = \frac{35}{40}$ of $P(NF) = \frac{7}{8}$<br><b>NOTA: Aanvaar: 0,9</b>                                                                                                                       | ✓ antwoord                                                             | (1) |
|      | 11.2.2 | Nie Foutief (NF)/ Foutief (F)<br>$P(NF \text{ en } F) + P(F \text{ en } NF)$<br>$= \left(\frac{35}{40} \cdot \frac{5}{39}\right) + \left(\frac{5}{40} \cdot \frac{35}{39}\right)$<br>$= \frac{35}{156} \dots \text{of} \dots 0,22$ | ✓ formule ( kan impliseer wees)<br><br>✓ substitusie<br><br>✓ antwoord | (3) |
|      | 11.2.3 | Foutief (F)<br>$P(F \text{ en } F)$<br>$= \frac{5}{40} \cdot \frac{4}{39}$<br>$= \frac{20}{1560} \dots \text{of} \dots \frac{1}{78} \dots \text{of} \dots 0,01$                                                                    | ✓ $\frac{5}{40}$<br>✓ $\frac{4}{39}$<br>✓ answer                       | (3) |

|                |        |                                                                                                                                                                                                                                |                                                                                      |             |
|----------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------|
| 11.3           | 11.3.1 | $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ <b>OF</b> $7!$ <b>OF</b> 5 040                                                                                                                                       | ✓ antwoord                                                                           | (1)         |
|                |        |                                                                                                                                                                                                                                |                                                                                      |             |
|                | 11.3.2 | Totale aantal rangskikkings<br>= $2! \times 6!$<br><br><b>OF</b><br><br>1 440                                                                                                                                                  | ✓ antwoord                                                                           | (1)         |
|                |        |                                                                                                                                                                                                                                |                                                                                      |             |
|                | 11.3.3 | Ekonomie boeke = $4!$<br><br>Lewenswetenskap boeke = $3!$<br><br>Ekonomie en Lewenswetenskap = $2!$<br><br>Totale aantal = $4! \times 3! \times 2!$<br><br><b>OF</b><br><br>$24 \times 6 \times 2$<br><br><b>OF</b><br><br>288 | ✓ kombinasies van<br>alle kriteria<br><br><br><br><br><br><br><br><br><br>✓ antwoord | (2)         |
|                |        |                                                                                                                                                                                                                                |                                                                                      | <b>[14]</b> |
|                |        |                                                                                                                                                                                                                                |                                                                                      |             |
| <b>TOTAAL:</b> |        |                                                                                                                                                                                                                                |                                                                                      | <b>144</b>  |

**NOTA:**

**Die finale punt uit 144 moet verwerk word na 'n TOTALE PUNT uit 150.**

**VERDUIDELIKING VAN VRAAG 10**

- Uit die probleem lei mens af dat vir elke R100 wat die kamer se prys toeneem, word daar 2 kamers minder uitverhuur.
- Om die aantal kamers te bepaal wat uitverhuur word, moet die aantal verhogings van R100 bepaal word want daardie getal moet met 2 vermenigvuldig word om van 72 af te trek.

**Voorbeeld:**

Stel die kamers word teen R800 per dag uit verhuur, dan sal die aantal verhogings van R100, 3 wees.

$$\text{Dus: aantal verhogings} = \frac{800 - 500}{100}$$

Daar word nou  $72 - 2(3) = 66$  kamers uitverhuur.

Inkomste:  $R800 \times 66 = R52\,800$ .

Nou is die nuwe prys per kamer nie R800 nie maar Rx dus lyk formule nou so:

$$\text{aantal verhogings} = \frac{x - 500}{100}$$

$$\text{Aantal kamers uit verhuur} = 72 - 2\left(\frac{x-500}{100}\right)$$

$$\text{Inkomste is nou} = x \left[ 72 - 2\left(\frac{x-500}{100}\right) \right]$$