



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**SENIOR CERTIFICATE EXAMINATIONS/  
NATIONAL SENIOR CERTIFICATE EXAMINATIONS/  
SENIORSERTIFIKAAT-EKSAMEN/  
NASIONALE SENIORSERTIFIKAAT-EKSAMEN**

**MATHEMATICS P1/WISKUNDE VI**

**MAY/JUNE/MEI/JUNIE 2025**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MARKS/PUNTE: 150**

These marking guidelines consist of 15 pages.  
Hierdie nasienriglyne bestaan uit 15 bladsye.

Approved  
*[Signature]*  
2025-05-13

Approved  
Opvoedkundige DBE in  
23/5/2025

**NOTE:**

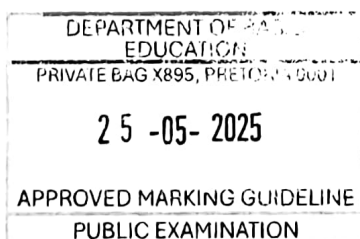
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Consistent Accuracy applies in all aspects of the marking guidelines.

**LET WEL:**

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toepassing.

**QUESTION 1/VRAAG 1**

|       |                                                                                                                                                       |                                                                                                            |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 1.1.1 | $x^2 - 3x - 10 = 0$<br>$(x + 2)(x - 5) = 0$<br>$x = -2$ or $x = 5$                                                                                    | ✓ factors/formula<br>✓ answer<br>✓ answer<br>(3)                                                           |
| 1.1.2 | $3x^2 + 6x + 1 = 0$<br>$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(3)(1)}}{2(3)}$<br>$x = -1,82$ or $x = -0,18$                                               | ✓ correct substitution into correct formula<br>✓ answer<br>✓ answer<br>(3)                                 |
| 1.1.3 | $2^{x+4} + 2^x = 8704$<br>$2^x(16 + 1) = 8704$<br>$2^x = 512$ OR/OF $2^x = 512$<br>$= 2^9$<br>$x = 9$ OR/OF $x = \log_2 512 = 9$                      | ✓ factorisation<br>✓ simplify to exponential eq<br>✓ answer<br>(3)                                         |
| 1.1.4 | $(x - 8)(x + 2) \leq 0$<br>CV: $x = 8$ or $x = -2$<br>$\therefore -2 \leq x \leq 8$ OR/OF $x \in [-2; 8]$                                             | ✓ critical values<br>✓ answer<br>(3)                                                                       |
| 1.1.5 | $x + 3\sqrt{x+2} = 2$<br>$3\sqrt{x+2} = 2 - x$<br>$9(x+2) = 4 - 4x + x^2$<br>$x^2 - 13x - 14 = 0$<br>$(x - 14)(x + 1) = 0$<br>$x \neq 14$ or $x = -1$ | ✓ isolating the surd<br>✓ squaring both sides(method)<br>✓ standard form<br>✓ answer with selection<br>(4) |



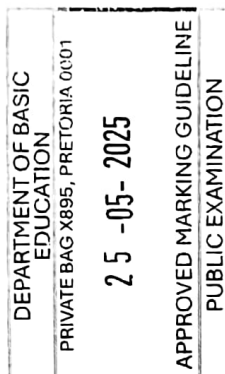
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|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                       |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.2 | $(y-3)(x+2) = 32$ $yx + 2y - 3x - 6 = 32 \quad \dots(1)$ $2(y-3) + 2(x+2) = 24$ $y + x - 1 = 12$ $y = 13 - x \quad \dots(2)$ $(13-x)x + 2(13-x) - 3x - 6 = 32$ $13x - x^2 + 26 - 2x - 3x - 6 - 32 = 0$ $-x^2 + 8x - 12 = 0$ $x^2 - 8x + 12 = 0$ $(x-6)(x-2) = 0$ $x = 6 \quad \text{or} \quad x = 2$ $y = 13 - 6 \quad \text{or} \quad y = 13 - 2$ $y = 7 \quad \quad \quad y = 11$ <p><b>OR/OF</b></p> $(y-3)(x+2) = 32$ $yx + 2y - 3x - 6 = 32 \quad \dots(1)$ $2(y-3) + 2(x+2) = 24$ $y + x - 1 = 12$ $x = 13 - y \quad \dots(2)$ $y(13-y) + 2y - 3(13-y) - 6 = 32$ $13y - y^2 + 2y - 39 + 3y - 6 - 32 = 0$ $-y^2 + 18y - 77 = 0$ $y^2 - 18y + 77 = 0$ $(y-7)(y-11) = 0$ $y = 7 \quad \text{or} \quad y = 11$ $x = 13 - 7 \quad \text{or} \quad x = 13 - 11$ $x = 6 \quad \quad \quad x = 2$ | <p>✓ setting up eq 1 (Area)</p> <p>✓ setting up eq 2 (Perimeter)</p> <p>✓ substitution</p> <p>✓ standard form</p> <p>✓ x-values</p> <p>✓ y-values</p> <p>(6)</p> <p><b>OR/OF</b></p> <p>✓ setting up eq 1 (Area)</p> <p>✓ setting up eq 2 (Perimeter)</p> <p>✓ substitution</p> <p>✓ standard form</p> <p>✓ y-values</p> <p>✓ x-values</p> <p>(6)</p> |
| 1.3 | $(1+x^m+x^{-n})^2 - (1-x^m-x^{-n})^2$ $= [1+x^m+x^{-n} - (1-x^m-x^{-n})][1+x^m+x^{-n} + (1-x^m-x^{-n})]$ $= (2)(2x^m + 2x^{-n})$ <p><b>OR/OF</b></p> $(1+x^m+x^{-n})^2 = 1+x^m+x^{-n}+x^m+x^{2m}+x^{m-n}+x^{-n}+x^{m-n}+x^{-2n}$ $= 1+2x^m+2x^{-n}+2x^{m-n}+x^{2m}+x^{-2n}$ $(1-x^m-x^{-n})^2 = 1-2x^m-2x^{-n}+2x^{m-n}+x^{2m}+x^{-2n}$ $(1+x^m+x^{-n})^2 - (1-x^m-x^{-n})^2 = 4x^m+4x^{-n}$ $= 4(x^m+x^{-n})$ $= (2)(2x^m+2x^{-n})$                                                                                                                                                                                                                                                                                                                                                            | <p>✓ factorisation</p> <p>✓ 2</p> <p>✓ <math>(2x^m + 2x^{-n})</math></p> <p>(3)</p> <p><b>OR/OF</b></p> <p>✓ expansion</p> <p>✓ 4</p> <p>✓ <math>(x^m + x^{-n})</math></p> <p>(3)</p>                                                                                                                                                                 |

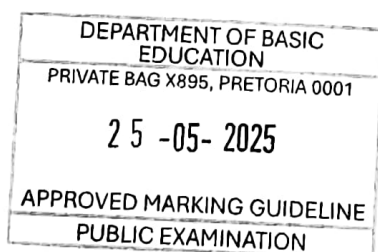
[25]

## QUESTION/VRAAG 2

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                          |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1.1    | $T_n = 2n + 3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ✓ $2n$ ✓ $3$<br>(2)                                                                                                                                                                                                                                                                      |
| 2.1.2    | $93 = 2n + 3$<br>$90 = 2n$<br>$45 = n$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ✓equating<br>✓answer<br>(2)                                                                                                                                                                                                                                                              |
| 2.1.3    | $50 + 70 + 90 + \dots + 930$<br>$S_{45} = \frac{45}{2} [2(50) + (45 - 1)(20)]$<br>$S_{45} = R22\,050$<br>Total raised = R22 050<br><br><b>OR/OF</b><br>$50 + 70 + 90 + \dots + 930$<br>$S_{45} = \frac{45}{2} [50 + 930]$<br>$S_{45} = R22\,050$<br>Total raised = R22 050<br><br><b>OR/OF</b><br>$5 + 7 + 9 + \dots + 93$<br>$S_{45} = \frac{45}{2} [2(5) + (45 - 1)(2)]$<br>$S_{45} = 2\,205\text{km}$<br>$S_{45} = R22\,050$<br>Total raised = R22 050<br><br><b>OR/OF</b><br>$5 + 7 + 9 + \dots + 93$<br>$S_{45} = \frac{45}{2} [5 + 93]$<br>$S_{45} = 2\,205\text{km}$<br>$S_{45} = R22\,050$<br>Total raised = R22 050 | ✓convert to money<br>✓substitution<br>✓answer<br>(3)<br><br><b>OR/OF</b><br>✓convert to money<br>✓substitution<br>✓answer<br>(3)<br><br><b>OR/OF</b><br>✓substitution<br>✓answer<br>✓convert to money<br>(3)<br><br><b>OR/OF</b><br>✓substitution<br>✓answer<br>✓convert to money<br>(3) |
| 2.2.1 a) | $T_1 = (2)^{1+2}$<br>$T_1 = 8$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ✓ $a = 8$<br>(1)                                                                                                                                                                                                                                                                         |
| 2.2.1 b) | $r = 2$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ✓ $r = 2$<br>(1)                                                                                                                                                                                                                                                                         |
| 2.2.2    | $T_{20} = (2)^{20+2}$<br>$T_{20} = 2^{22} = (2^2)^{11}$<br>$= 4^{11}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ✓substitution<br>✓answer<br>(2)                                                                                                                                                                                                                                                          |

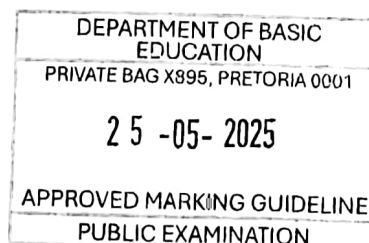


|       |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                      |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.2.3 | $\frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \dots$ $S_{\infty} = \frac{a}{1-r}$ $= \frac{\frac{1}{8}}{1-\frac{1}{2}}$ $\therefore S_{\infty} = \frac{1}{4}$                                                                                                                                      | ✓ series<br><br>✓ substitution<br><br>✓ answer<br><br>(3)                                                                                                                                                                                                                            |
| 2.2.4 | $8 + 4^2 + 32 + 4^3 + \dots + 4^{11} + \dots$ $S_{21} - S_{10} = \frac{8(2^{21} - 1)}{2 - 1} - \frac{16(4^{10} - 1)}{4 - 1}$ $= 16\,777\,208 - 5\,592\,400$ $= 11\,184\,808$ <p><b>OR/OF</b></p> $8 + 32 + 128 + \dots$ $S_{11} = \frac{8(4^{11} - 1)}{4 - 1}$ $\therefore S_{11} = 11\,184\,808$ | $\checkmark \frac{8(2^{21} - 1)}{2 - 1}$ $\checkmark n = 10$ $\checkmark \frac{16(4^{10} - 1)}{4 - 1}$ $\checkmark 11\,184\,808$ <p>(4)</p> <p><b>OR/OF</b></p> $\checkmark n = 11$ $\checkmark r = 4$ $\checkmark \frac{8(4^{11} - 1)}{4 - 1}$ $\checkmark 11\,184\,808$ <p>(4)</p> |
|       |                                                                                                                                                                                                                                                                                                   | [18]                                                                                                                                                                                                                                                                                 |



**QUESTION/VRAAG 3**

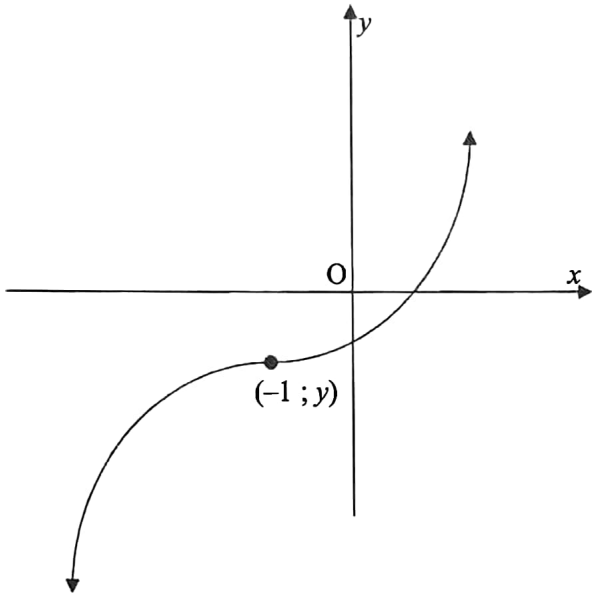
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|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 | $  \begin{array}{ccccccc}  14 & ; & 9 & ; & 6 & ; & 5 & ; & \dots \\  & \swarrow & & \searrow & \swarrow & & \searrow & & \\  & -5 & & -3 & & -1 & & & \\  & \swarrow & & \searrow & \swarrow & & \searrow & & \\  & 2 & & 2 & & & & &   \end{array}  $ $  \begin{array}{lll}  2a = 2 & 3(1) + b = -5 & 1 - 8 + c = 14 \\  a = 1 & b = -8 & c = 21 \\  \therefore T_n = n^2 - 8n + 21  \end{array}  $                                                         | $  \begin{array}{l}  \checkmark 2a = 2 \\  \checkmark 3(1) + b = -5 \\  \checkmark 1 - 8 + c = 14  \end{array}  $ <p style="text-align: right;">(3)</p>                                                                                                                                                                                                                         |
| 3.2 | $  \begin{array}{l}  T_n = -5 + (n-1)(2) \\  T_n = 2n - 7 \\  2n - 7 = 33 \\  \therefore n = 20 \\  \therefore T_{21} = (21)^2 - 8(21) + 21 \\  T_{21} = 294  \end{array}  $ <p><b>OR/OF</b></p> $  \begin{array}{l}  \therefore T_{n+1} - T_n = (n+1)^2 - 8(n+1) + 21 - n^2 + 8n - 21 \\  n^2 + 2n + 1 - 8n - 8 + 21 - n^2 + 8n - 21 = 33 \\  2n - 7 = 33 \\  \therefore n = 20 \\  \therefore T_{21} = (21)^2 - 8(21) + 21 \\  T_{21} = 294  \end{array}  $ | $  \begin{array}{l}  \checkmark \text{general term} \\  \checkmark \text{equating to 33}  \end{array}  $<br>$  \checkmark \text{answer}  $ <p style="text-align: right;">(3)</p> <p><b>OR/OF</b></p> $  \begin{array}{l}  \checkmark T_{n+1} - T_n \\  \checkmark \text{equating to 33}  \end{array}  $<br>$  \checkmark \text{answer}  $ <p style="text-align: right;">(3)</p> |
| 3.3 | $  \begin{array}{l}  T_7 = T_1 = 14 \\  \therefore 14 + m \geq 0 \\  m \geq -14 \\  \text{And } T_6 = T_2 \\  \therefore 9 + m < 0 \\  m < -9 \\  \therefore -14 \leq m < -9  \end{array}  $                                                                                                                                                                                                                                                                  | $  \checkmark -14  $<br>$  \checkmark -9  $ $  \checkmark -14 \leq m < -9  $ <p style="text-align: right;">(3)</p>                                                                                                                                                                                                                                                              |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>[9]</b>                                                                                                                                                                                                                                                                                                                                                                      |

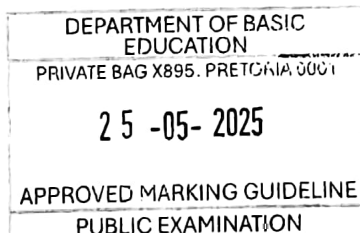


## QUESTION/VRAAG 4

|     |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                      |                |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 4.1 | M(3 ; 4)                                                                                                                                                                                                                                                                                                           | $\checkmark x = 3$<br>$\checkmark y = 4$                                                                                                                                                                                                                                                                                                                                             | (2)            |
| 4.2 | $f(x) = \frac{4}{x-3} + 4$<br>$y = \frac{4}{0-3} + 4 = \frac{8}{3}$<br>$\therefore D\left(0; \frac{8}{3}\right)$                                                                                                                                                                                                   | $\checkmark x = 0$<br>$\checkmark y\text{-value}$                                                                                                                                                                                                                                                                                                                                    | (2)            |
| 4.3 | M(3 ; 4)<br>$y = x + t$<br>$4 = 3 + t$<br>$t = 1$ OR/OF<br>$y = (x + p) + q$<br>$y = x - 3 + 4$<br>$y = x + 1$<br>$\therefore t = 1$                                                                                                                                                                               | $\checkmark$ substituting M<br>$\checkmark$ value of $t$                                                                                                                                                                                                                                                                                                                             | (2)            |
| 4.4 | $\frac{4}{x-3} + 4 = 0$<br>$-4(x-3) = 4$<br>$x-3 = -1$<br>$x = 2$<br>C(2 ; 0)<br>$\therefore 2 \leq x < 3$                                                                                                                                                                                                         | $\checkmark y = 0$<br>$\checkmark x = 2$<br>$\checkmark\checkmark$ answer                                                                                                                                                                                                                                                                                                            | (4)            |
| 4.5 | $\frac{4}{x-3} + 4 = x + 1$<br>$\frac{4}{x-3} = x - 3$<br>$4 = (x-3)^2$<br>$\pm 2 = x - 3$<br>$\therefore x = 5$ or $x \neq 1$<br>$\therefore A(5 ; 6)$<br>OR/OF<br>Point closest to the origin in $y = \frac{a}{x}$ is $(\sqrt{a}; \sqrt{a})$<br>By translation:<br>A( $\sqrt{a} + 3; \sqrt{a} + 4$ )<br>A(5 ; 6) | <div style="border: 1px solid black; padding: 5px; text-align: center;"> DEPARTMENT OF BASIC<br/>EDUCATION<br/>PRIVATE BAG X895, PRETORIA 0001<br/><br/> 25 -05- 2025<br/><br/> APPROVED MARKING GUIDELINE<br/>PUBLIC EXAMINATION </div><br>$\checkmark$ equating<br><br>$\checkmark x_A \checkmark y_A$<br>OR/OF<br><br>$\checkmark$ translation<br>$\checkmark x_A \checkmark y_A$ | (3)<br><br>(3) |
| 4.6 | $h(x) = \frac{-4}{x+3} + 4$<br>$= \frac{4}{-x-3} + 4$<br>$\therefore$ Reflection in $y$ - axis.<br>A'(-5;6)<br>AA' = 10                                                                                                                                                                                            | $\checkmark$ coordinates<br>$\checkmark$ distance                                                                                                                                                                                                                                                                                                                                    | (2)            |

**QUESTION/VRAAG 5**

|     |                                                                                                                    |                                                                                                                             |
|-----|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 5.1 | $y = a(x+1)^2 + 4$<br>$-4 = a(-3+1)^2 + 4$<br>$-8 = 4a$<br>$-2 = a$<br>$y = -2(x+1)^2 + 4$<br>$y = -2x^2 - 4x + 2$ | ✓ substitute $(-1 ; 4)$<br>✓ substitute $(-3 ; -4)$<br>✓ $-8 = 4a$                                                          |
| 5.2 | $k < -4$                                                                                                           | ✓ ✓ $k < -4$<br>(2)                                                                                                         |
| 5.3 |                                  | ✓ point of inflection<br>✓ change of concavity at<br>$x = -1$<br>✓ y-intercept below<br>x-axis<br>✓ increasing curve<br>(4) |
|     |                                                                                                                    | [9]                                                                                                                         |



## QUESTION/VRAAG 6

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                 |     |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 6.1 | $(0; -3) \quad -3 = p^0 + q \quad \text{OR} \quad y = p^x - 4$<br>$q = -4$<br>$(3; 4) \quad 4 = p^3 - 4$<br>$p^3 = 8$<br>$p = 2$<br>$\therefore f(x) = 2^x - 4$                                                                                                                                                                                                                                                                                                        | ✓ substitute $(0; -3)$<br>✓ answer for $q$<br>✓ substitute $(3; 4)$<br><br>✓ answer for $p$                                                                                                     | (4) |
| 6.2 | $y > -4 \quad \text{OR/OF} \quad y \in (-4; \infty)$                                                                                                                                                                                                                                                                                                                                                                                                                   | ✓ answer                                                                                                                                                                                        | (1) |
| 6.3 | $g(x) = mx + c$<br>$E(-3; 0)$<br>$m = \frac{4-0}{3-(-3)} = \frac{2}{3}$<br>$y = \frac{2}{3}x + c$<br>$0 = \frac{2}{3}(-3) + c \quad \text{OR} \quad y - 0 = \frac{2}{3}(x + 3)$<br>$\therefore c = 2$<br>$y = \frac{2}{3}x + 2$<br><br><b>OR/OF</b><br>For $g^{-1}$ :<br>$y = mx - 3$<br>$3 = m(4) - 3$<br>$m = \frac{3}{2}$<br>$\therefore g^{-1}(x) = \frac{3}{2}x - 3$<br>For $g$ :<br>$2x + 6 = 3y$<br>$\frac{2}{3}x + 2 = y$<br>$\therefore y = \frac{2}{3}x + 2$ | ✓ $E(-3; 0)$<br>✓ $m_{AE}$<br><br>✓ substitution<br><br>✓ equation<br><br><b>OR/OF</b><br><br>✓ substitution of $(4; 3)$<br>✓ $m$ of inverse<br>✓ equation of $g^{-1}$<br><br>✓ equation of $g$ | (4) |
| 6.4 | $g(x) = \frac{2}{3}x + 2$<br>$x = \frac{2}{3}y + 2$<br>$g^{-1}(x) = \frac{3}{2}x - 3$                                                                                                                                                                                                                                                                                                                                                                                  | ✓ swop $x$ and $y$<br><br>✓ equation                                                                                                                                                            | (2) |

[11]

## QUESTION/VRAAG 7

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                        |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.1 | $(1+i) = \left(1 + \frac{15}{1200}\right)^{12}$ $i = 16,08\%$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ✓ substitution into correct formula<br>✓ answer<br>(2)                                                                                                                                                 |
| 7.2 | $P = \frac{x[1 - (1+i)^{-n}]}{i}$ $500\,000 = \frac{11\,250 \left[1 - \left(1 + \frac{0,06}{4}\right)^{-n}\right]}{\frac{0,06}{4}}$ $\frac{2}{3} = 1 - \left(1 + \frac{0,06}{4}\right)^{-n}$ $(1,015)^{-n} = \frac{1}{3}$ $-n = \log_{1,015}\left(\frac{1}{3}\right)$ $n = 73,788\dots$ $\therefore n = 73 \text{ withdrawals}$ <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">         DEPARTMENT OF<br/>EDUCATION<br/>PRIVATE BAG X696<br/>25 -05- 2025<br/>APPROVED MARKING GUIDE<br/>PUBLIC EXAMINATION       </div> | ✓ $i = \frac{0,06}{4}$<br>✓ substitution into correct formula<br><br>✓ correct use of logs<br>✓ answer for $n$<br>✓ final answer<br>(5)                                                                |
| 7.3 | $A = P(1+i)^n$ $= 12\,000 \left(1 + \frac{0,095}{12}\right)^{12 \times 4}$ $= R\,17\,521,17895\dots$ $F = \frac{x[(1+i)^n - 1]}{i}$ $F = \frac{500 \left[\left(1 + \frac{0,095}{12}\right)^{24} - 1\right]}{\frac{0,095}{12}}$ $= R\,13\,158,64744\dots$ $\text{Total} = 17\,521,17895\dots + 13\,158,64744\dots$ $= R\,30\,679,83$                                                                                                                                                                                                                                  | ✓ $i = \frac{0,095}{12}$<br>✓ $n = 48$ in $A$<br>✓ substitution into correct formula<br><br>✓ $n = 24$ in $F$<br>✓ substitution into correct formula<br><br>✓ adding compound and future values<br>(6) |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | [13]                                                                                                                                                                                                   |

## QUESTION/VRAAG 8

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.1   | $f(x) = x^2 - 2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - 2 - (x^2 - 2)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{h(2x + h)}{h}$ $f'(x) = \lim_{h \rightarrow 0} (2x + h)$ $\therefore f'(x) = 2x$ <p><b>OR/OF</b></p> $f(x) = x^2 - 2$ $f(x+h) = (x+h)^2 - 2 = x^2 + 2xh + h^2 - 2$ $f(x+h) - f(x) = 2xh + h^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{h(2x + h)}{h}$ $f'(x) = \lim_{h \rightarrow 0} (2x + h)$ $\therefore f'(x) = 2x$ <div style="border: 1px solid black; padding: 5px; text-align: center;"> DEPARTMENT OF BASIC<br/>EDUCATION<br/>PRIVATE BAG X895, PRETORIA 0001<br/><br/>25 -05- 2025<br/><br/>APPROVED MARKING GUIDELINE<br/>PUBLIC EXAMINATION </div> | <ul style="list-style-type: none"> <li>✓ <math>f(x+h)</math></li> <li>✓ substitution</li> <li>✓ simplification</li> <li>✓ factorisation</li> <li>✓ answer</li> </ul> <p style="text-align: right;">(5)</p> <p><b>OR/OF</b></p> <ul style="list-style-type: none"> <li>✓ <math>f(x+h)</math></li> <li>✓ simplification</li> <li>✓ substitution</li> <li>✓ factorisation</li> <li>✓ answer</li> </ul> <p style="text-align: right;">(5)</p> |
| 8.2.1 | $\frac{d}{dx} [3x^2 - 4x]$ $= 6x - 4$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>✓ <math>6x</math></li> <li>✓ <math>-4</math></li> </ul> <p style="text-align: right;">(2)</p>                                                                                                                                                                                                                                                                                                      |
| 8.2.2 | $g(x) = -2\sqrt{x}(x-1)^2$ $g(x) = -2x^{\frac{1}{2}}(x^2 - 2x + 1)$ $g(x) = -2x^{\frac{5}{2}} + 4x^{\frac{3}{2}} - 2x^{\frac{1}{2}}$ $g'(x) = -5x^{\frac{3}{2}} + 6x^{\frac{1}{2}} - x^{\frac{-1}{2}}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>✓ <math>x^{\frac{1}{2}}</math></li> <li>✓ expansion</li> <li>✓ <math>-5x^{\frac{3}{2}} + 6x^{\frac{1}{2}}</math></li> <li>✓ <math>-x^{\frac{-1}{2}}</math></li> </ul> <p style="text-align: right;">(4)</p>                                                                                                                                                                                        |

8.3

$$y = 4x - 14 \quad \text{tangent}$$

$$\therefore 4x - 4 = 4$$

$$4x = 8$$

$$x = 2$$

$$\therefore y = 4(2) - 14$$

$$\text{at point } (2 ; -6)$$

$$g(2) = a(2)^2 + b(2) - 18 = -6$$

$$4a + 2b = 12 \quad \dots(1)$$

$$g'(2) = 2a(2) + b = 4$$

$$4a + b = 4 \quad \dots(2)$$

$$(1) - (2)$$

$$b = 8$$

$$4a + b = 4$$

$$4a + 8 = 4$$

$$4a = -4$$

$$a = -1$$

**OR/OF**

$$2x^2 - 4x - 6 = 4x - 14$$

$$2x^2 - 8x + 8 = 0$$

$$x^2 - 4x + 4 = 0$$

$$(x - 2)^2 = 0$$

$$\therefore x = 2$$

$$\therefore y = 4(2) - 14$$

$$\text{at point } (2 ; -6)$$

$$g(2) = a(2)^2 + b(2) - 18 = -6$$

$$4a + 2b = 12 \quad \dots(1)$$

$$g'(2) = 2a(2) + b = 4$$

$$4a + b = 4 \quad \dots(2)$$

$$(1) - (2)$$

$$b = 8$$

$$4a + b = 4$$

$$4a + 8 = 4$$

$$4a = -4$$

$$a = -1$$

$$\checkmark 4x - 4 = 4$$

$$\checkmark y\text{-value}$$

$$\checkmark g(2) = y\text{-value}$$

$$\checkmark g'(2) = 4$$

$$\checkmark a \text{ and } b$$

(6)

**OR/OF**

$$\checkmark \text{equating}$$

$$\checkmark y\text{-value}$$

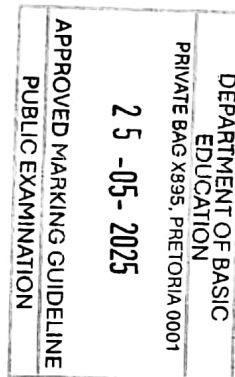
$$\checkmark g(2) = y\text{-value}$$

$$\checkmark g'(x) \quad \checkmark g'(2) = 4$$

$$\checkmark a \text{ and } b$$

(6)

[17]





**QUESTION/VRAAG 10**

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                               |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 10.1 | $P(A \text{ or } B) = P(A) + P(B)$<br>$P(B) = P(A \text{ or } B) - P(A)$<br>$= 0,79 - 0,42$<br>$= 0,37$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ✓ substitution<br>✓ answer<br>(2)                                                                                             |
| 10.2 | <p>People pay: R2 600<br/> <math>0,7 \times R2\ 600 = R1\ 820</math><br/> Total value of pay-outs = R2 600 – R1 820<br/> = R780</p> <p><math>P(\text{someone to win}) = \frac{16}{52} \times \frac{1}{2}</math><br/> <math>= \frac{2}{13}</math></p> <p>Total number of people winning = <math>\frac{2}{13} \times 260</math><br/> = 40</p> <p><math>\therefore \text{Pay-out} = \frac{R780}{40}</math><br/> = R19,50 per person winning</p> <p><b>OR/OF</b><br/> People pay: R2 600<br/> Total value of pay-outs<br/> = <math>0,3 \times R2\ 600</math><br/> = R780</p> <p><math>P(\text{someone to win}) = \frac{16}{52} \times \frac{1}{2}</math><br/> <math>= \frac{2}{13}</math></p> <p>Total number of people winning = <math>\frac{2}{13} \times 260</math><br/> = 40</p> <p><math>\therefore \text{Pay-out} = \frac{R780}{40}</math><br/> = R19,50 per person winning</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> DEPARTMENT OF BASIC<br/> EDUCATION<br/> PRIVATE BAG X8395, PRETORIA 0001<br/> 25-05-2025<br/> APPROVED MARKING GUIDELINE<br/> PUBLIC EXAMINATION </div> | ✓ R1 820<br>✓ amount willing to pay-out<br><br>✓ $\frac{16}{52}$<br>✓ $\frac{2}{13}$<br><br>✓ winners<br><br>✓ pay-out<br>(6) |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (6)                                                                                                                           |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[8]</b>                                                                                                                    |

**QUESTION/VRAAG 11**

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.1 | $\frac{1}{\textcircled{5}} \times \frac{9}{\textcircled{5}} \times \frac{9}{\textcircled{5}} = 81$ <p>500 cannot be included <math>\therefore</math> 80 possibilities</p> $\frac{4}{\textcircled{5}} \times \frac{1}{\textcircled{5}} \times \frac{9}{\textcircled{5}} = 36$ $\frac{4}{\textcircled{5}} \times \frac{9}{\textcircled{5}} \times \frac{1}{\textcircled{5}} = 36$ <p>Total possibilities<br/> <math>= 80 + 36 + 36</math><br/> <math>= 152</math></p> <p><b>OR</b></p> <p>501 to 599: <math>99 - 10 - 9 = 80</math> possibilities</p> <p>601 to 699: <math>9 + 9 = 18</math> possibilities of having a 5 in the 10's digit or units digit.</p> <p>Thus 601 to 699 <math>= 4 \times 18</math></p> <p>Total possibilities<br/> <math>= 4 \times 18 + 80</math><br/> <math>= 152</math></p> | $\checkmark 1 \times 9 \times 9$<br><br>$\checkmark 4 \times 1 \times 9$<br><br>$\checkmark 4 \times 9 \times 1$<br><br>$\checkmark 152$<br><br>$\checkmark 80$<br>$\checkmark 18$<br><br>$\checkmark 4 \times 18$<br>$\checkmark 152$ |
| 11.2 | <p>P(not having such a number)</p> $= 1 - \frac{152}{499}$ $= \frac{347}{499}$ $= 0,70$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $\checkmark n(S) = 499$<br>$\checkmark 1 - P(\text{having number})$<br>$\checkmark \text{numerator}$                                                                                                                                   |

**TOTAL/TOTAAL: 150**