



# basic education

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

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

**MATHEMATICS P1/WISKUNDE VI**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MAY/JUNE/MEI/JUNIE 2023**

**MARKS: 150  
PUNTE: 150**

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

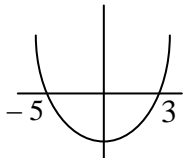
**NOTE:**

- 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, merk slegs die EERSTE poging.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toepassing.

**QUESTION 1/VRAAG 1**

<p>1.1.1</p>	$x^2 - 7x + 12 = 0$ $(x - 4)(x - 3) = 0$ $x = 4 \text{ or } x = 3$	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">                 Answer only: Full Marks             </div>	<ul style="list-style-type: none"> <li>✓ factors</li> <li>✓ <math>x = 4</math></li> <li>✓ <math>x = 3</math></li> </ul> <p style="text-align: right;">(3)</p>
<p>1.1.2</p>	$3x^2 + 5x - 1 = 0$ $x = \frac{-5 \pm \sqrt{5^2 - 4(3)(-1)}}{2(3)} = \frac{-5 \pm \sqrt{37}}{6}$ $\therefore x = 0,18 \text{ or } x = -1,85$		<ul style="list-style-type: none"> <li>✓ standard form</li> <li>✓ substitution into the correct formula</li> <li>✓ <math>x = 0,18</math></li> <li>✓ <math>x = -1,85</math></li> </ul> <p style="text-align: right;">(4)</p>
<p>1.1.3</p>	$x^2 + 2x - 15 < 0$ $(x - 3)(x + 5) < 0$ $x = 3 \text{ or } x = -5$ $-5 < x < 3$		<ul style="list-style-type: none"> <li>✓ standard form</li> <li>✓ critical values</li> <li>✓✓ answer</li> </ul> <p style="text-align: right;">(4)</p>
<p>1.1.4</p>	$\sqrt{2(1-x)} = x - 1$ $(\sqrt{2(1-x)})^2 = (x - 1)^2$ $2 - 2x = x^2 - 2x + 1$ $x^2 - 1 = 0$ $\therefore x = 1 \text{ and } x \neq -1$		<ul style="list-style-type: none"> <li>✓ squaring both sides</li> <li>✓ simplification</li> <li>✓ standard form</li> <li>✓ answer with selection</li> </ul> <p style="text-align: right;">(4)</p>

<p>1.2</p>	$3^{x+y} = 27$ $x^2 + y^2 = 17$ $3^{x+y} = 3^3$ $x + y = 3 \dots\dots(1)$ $y = 3 - x$ $x^2 + (3 - x)^2 = 17$ $2x^2 - 6x - 8 = 0$ $x^2 - 3x - 4 = 0$ $(x - 4)(x + 1) = 0$ $x = 4 \text{ or } x = -1$ $y = -1 \text{ or } y = 4$ <p><b>OR/OF</b></p> $3^{x+y} = 27$ $x^2 + y^2 = 17$ $3^{x+y} = 3^3$ $x + y = 3 \dots\dots(1)$ $x = 3 - y$ $(3 - y)^2 + y^2 = 17$ $9 - 6y + y^2 + y^2 - 17 = 0$ $2y^2 - 6y - 8 = 0$ $y^2 - 3y - 4 = 0$ $(y - 4)(y + 1) = 0$ $y = -1 \text{ or } y = 4$ $x = 4 \text{ or } x = -1$	$\checkmark 3^{x+y} = 3^3$ $\checkmark x + y = 3$ $\checkmark \text{substitution}$ $\checkmark \text{standard form}$ $\checkmark x\text{-values}$ $\checkmark y\text{-values} \quad (6)$ <p><b>OR/OF</b></p> $\checkmark 3^{x+y} = 3^3$ $\checkmark x + y = 3$ $\checkmark \text{substitution}$ $\checkmark \text{standard form}$ $\checkmark y\text{-values}$ $\checkmark x\text{-values} \quad (6)$
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1.3	$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \dots + \frac{1}{\sqrt{99} + \sqrt{100}}$ $= \frac{1}{\sqrt{1} + \sqrt{2}} \times \frac{\sqrt{1} - \sqrt{2}}{\sqrt{1} - \sqrt{2}} + \dots$ $+ \frac{1}{\sqrt{99} + \sqrt{100}} \times \frac{\sqrt{99} - \sqrt{100}}{\sqrt{99} - \sqrt{100}}$ $= -1 + \sqrt{2} - \sqrt{2} + \sqrt{3} - \sqrt{3} + 2\dots - \sqrt{99} + 10$ $= -1 + 10$ $= 9$	<p>✓ rationalisation</p> <p>✓ simplification</p> <p>✓ answer (3)</p>
		<b>[24]</b>

**QUESTION 2/VRAAG 2**

<p>2.1.1</p>	$\frac{1}{5} + \frac{1}{15} + \frac{1}{45} + \dots$ $r = \frac{\frac{1}{15}}{\frac{1}{5}} = \frac{1}{3}$ $-1 < \frac{1}{3} < 1$ <p>∴ the series is convergent.</p>	<p>✓ <math>r = \frac{1}{3}</math></p> <p>✓ answer (any indicator of convergence) (2)</p>
<p>2.1.2</p>	$S_{\infty} = \frac{a}{1-r}$ $= \frac{\frac{1}{5}}{1-\frac{1}{3}}$ $= \frac{3}{10}$	<p>✓ substitution</p> <p>✓ answer (2)</p>
<p>2.2.1</p>	<p><math>4x ; \frac{1}{81}</math></p>	<p>✓ <math>4x</math> ✓ <math>\frac{1}{81}</math> (2)</p>
<p>2.2.2</p>	<p><math>T_n = x + (n-1)x</math>  <math>= x + xn - x</math>  <math>= xn</math></p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">                 Answer only:                  Full Marks             </div> <p>✓ substitution</p> <p>✓ answer (2)</p>
<p>2.2.3</p>	<p><math>T_n = ar^{n-1}</math></p> <p><math>T_{13} = \frac{1}{3} \left(\frac{1}{3}\right)^{13-1}</math></p> <p><math>T_{13} = \left(\frac{1}{3}\right)^{13}</math> or <math>\frac{1}{1594323}</math> or <math>6,27 \times 10^{-7}</math> or <math>3^{-13}</math></p>	<p>✓ <math>n = 13</math></p> <p>✓ <math>r = \frac{1}{3}</math></p> <p>✓ answer (3)</p>
<p>2.2.4</p>	<p><math>\sum_{n=1}^{21} P_n = S_{11} + S_{10}</math></p> $= \frac{11}{2} [2x + 10x] + \frac{\frac{1}{3} \left[ 1 - \left(\frac{1}{3}\right)^{10} \right]}{1 - \frac{1}{3}}$ <p><math>= 66x + 0,5</math></p> <p><math>33,5 = 66x + 0,5</math></p> <p>∴ <math>x = \frac{1}{2}</math></p>	<p>✓ <math>S_{11}</math> ✓ <math>+S_{10}</math></p> <p>✓ arithmetic sum</p> <p>✓ geometric sum</p> <p>✓ <math>66x + 0,5</math> (A)</p> <p>✓ answer (6)</p>
		<p><b>[17]</b></p>

**QUESTION 3/VRAAG 3**

<p>3.1</p> $  \begin{array}{ccc}  x & ; & x & ; & T_3 & ; & \dots \\  \swarrow & & \searrow & & \swarrow & & \searrow \\  & 0 & & T_3 - x & & & \\  & \swarrow & & \searrow & & & \\  & & 10 & & & &   \end{array}  $ <p> <math>2a = 10</math>      <math>3a + b = 0</math>  <math>a = 5</math>              <math>b = -15</math> </p> <p> <math>T_3 - x - 0 = 10</math>  <math>\therefore T_3 = x + 10</math> </p> <p> <math>2x + T_3 = 28</math>  <math>2x + x + 10 = 28</math>  <math>3x = 18</math>  <math>x = 6</math> </p> <p> <math>a + b + c = 6</math>  <math>5 - 15 + c = 6</math>  <math>c = 16</math> </p> <p> <math>\therefore T_n = 5n^2 - 15n + 16</math> </p> <p><b>OR/OF</b></p> <p> <math>2a = 10</math>  <math>\therefore a = 5</math> </p> <p> <math>T_1 = a + b + c</math>    <math>T_2 = 4a + 2b + c</math>    <math>T_3 = 9a + 3b + c</math>  <math>= 5 + b + c</math>            <math>= 20 + 2b + c</math>            <math>= 45 + 3b + c</math> </p> <p> <math>5 + b + c = 20 + 2b + c</math>  <math>b = -15</math> </p> <p> <math>T_1 = -10 + c</math>    <math>T_2 = -10 + c</math>    <math>T_3 = c</math> </p> <p> <math>T_1 + T_2 + T_3 = -10 + c - 10 + c + c</math>  <math>28 = 3c - 20</math>  <math>c = 16</math> </p>	<p> <math>\checkmark 2a = 10</math>  <math>\checkmark 3a + b = 0</math> </p> <p> <math>\checkmark T_3 = x + 10</math> </p> <p> <math>\checkmark 2x + T_3 = 28</math> </p> <p> <math>\checkmark x = 6</math> </p> <p> <math>\checkmark 5 - 15 + c = 6</math> </p> <p style="text-align: right;">(6)</p> <p><b>OR/OF</b></p> <p> <math>\checkmark 2a = 10</math> </p> <p> <math>\checkmark 5 + b + c = 20 + 2b + c</math> </p> <p> <math>\checkmark T_1 = -10 + c</math>  <math>\checkmark T_2 = -10 + c</math> </p> <p> <math>\checkmark 28 = 3c - 20</math>  <math>\checkmark c = 16</math> </p> <p style="text-align: right;">(6)</p>
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3.2	$T_n = 5n^2 - 15n + 16$ $216 = 5n^2 - 15n + 16$ $5n^2 - 15n - 200 = 0$ $n^2 - 3n - 40 = 0$ $(n - 8)(n + 5) = 0$ $n = 8 \text{ or } n = -5$ $\therefore T_8 = 216$	✓ equating ✓ standard form ✓ $n = 8$ (3)
		<b>[9]</b>

**QUESTION 4/VRAAG 4**

4.1.1	decreasing	✓ decreasing (1)
4.1.2	$y = \left(\frac{1}{3}\right)^x$ $x = \left(\frac{1}{3}\right)^y$ $\therefore y = \log_{\frac{1}{3}} x$ <p><b>OR/OF</b></p> $y = 3^{-x}$ $x = 3^{-y}$ $\therefore y = -\log_3 x$	✓ swop x and y ✓ answer (2) <p><b>OR/OF</b></p> ✓ swop x and y ✓ answer (2)
4.1.3	$x > 0; x \in R$	✓ answer (1)
4.1.4	$y = -5$	✓ answer (1)
4.2.1	$x = 1$ $y = 2$	✓ $x = 1$ ✓ $y = 2$ (2)
4.2.2	$\frac{4}{x-1} + 2 = 0$ $4 = -2x + 2$ $2x = -2$ $x = -1$	✓ let $y = 0$ ✓ $x = -1$ (2)

<p>4.2.3</p>		<ul style="list-style-type: none"> <li>✓ asymptotes</li> <li>✓ x-intercept</li> <li>✓ y-intercept</li> <li>✓ shape</li> </ul> <p style="text-align: right;">(4)</p>
<p>4.2.4</p>	$\frac{4}{x-1} \geq -2$ $\frac{4}{x-1} + 2 \geq 0$ $x \leq -1 \text{ or } x > 1$	<ul style="list-style-type: none"> <li>✓ <math>x \leq -1</math></li> <li>✓ <math>x &gt; 1</math></li> </ul> <p style="text-align: right;">(2)</p>
<p>4.2.5</p>	$y = -x + c$ $2 = -3 + c$ $c = 5$ $y = -x + 5$ <p><b>OR/OF</b></p> $y = -x + c$ $2 = -1 + c$ $c = 3$ $y = -x + 3$ $y = -(x-2) + 3$ $y = -x + 5$ <p><b>OR/OF</b></p> $y = -(x+p) + q$ $y = -((x-2) + (-1)) + 2$ $y = -x + 5$	<ul style="list-style-type: none"> <li>✓ intersection of axes at (3 ; 2)</li> <li>✓ subst (3 ; 2) and <math>m = -1</math></li> </ul> <ul style="list-style-type: none"> <li>✓ <math>y = -x + 5</math></li> </ul> <p style="text-align: right;">(3)</p> <p><b>OR/OF</b></p> <ul style="list-style-type: none"> <li>✓✓ <math>-(x-2) + 3</math></li> <li>✓ <math>y = -x + 5</math></li> </ul> <p style="text-align: right;">(3)</p> <p><b>OR/OF</b></p> <ul style="list-style-type: none"> <li>✓✓ <math>y = -((x-2) + (-1)) + 2</math></li> <li>✓ <math>y = -x + 5</math></li> </ul> <p style="text-align: right;">(3)</p>
<p><b>[18]</b></p>		



## QUESTION 5/VRAAG 5

5.1	T.P(-3;4)	✓ - 3 ✓ 4 (2)
5.2	$y \leq 4$ or $y \in (-\infty; 4]$	✓ answer (1)
5.3	$f(x) = g(x)$ $-(x+3)^2 + 4 = x + 5$ $-x^2 - 6x - 9 + 4 = x + 5$ $-x^2 - 7x - 10 = 0$ $x^2 + 7x + 10 = 0$ $(x+5)(x+2) = 0$ $x = -5$ or $x = -2$	✓ equating ✓ $-x^2 - 6x - 9$ ✓ standard form ✓ factors (4)
5.4	The graph must shift more than 2 and less than 5 units to the right $\therefore -5 < c < -2$	✓✓ answer (2)
5.5	$D(x) = f(x) - g(x) = -x^2 - 7x - 10$  Max: $-2x - 7 = 0$ <b>OR/OF</b> $x = \frac{-(-7)}{2(-1)}$  $x = -\frac{7}{2}$  $D\left(-\frac{7}{2}\right) = -\left(-\frac{7}{2}\right)^2 - 7\left(-\frac{7}{2}\right) - 10 = 2,25$ $\therefore k = 2,25$ $\therefore h(x) = x + 7,25$	✓ distance  ✓ $-2x - 7 = 0$  ✓ $x = -\frac{7}{2}$  ✓ $k = 2,25$ ✓ $h(x) = x + 7,25$ (5)
		<b>[14]</b>

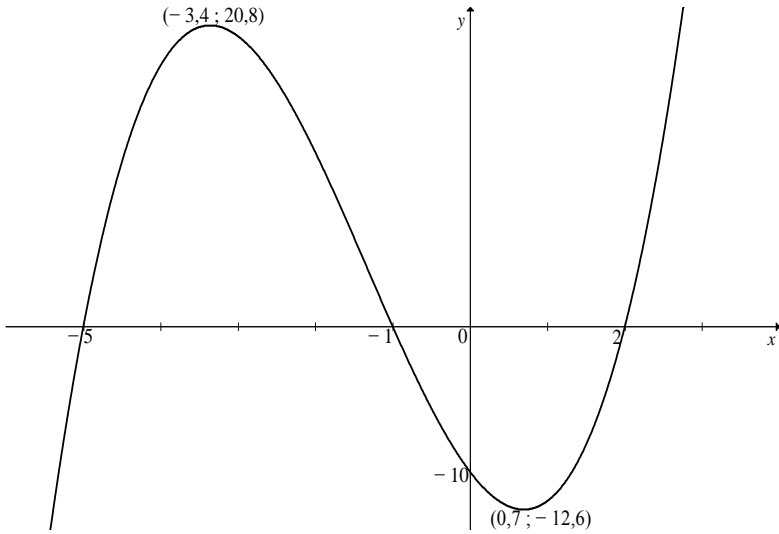
**QUESTION 6/VRAAG 6**

<p>6.1.1</p>	$A = P(1+i)^n$ $A = 150\,000(1+0,065)^5$ $A = R205\,513$	<p>✓ substitution into the correct formula                  ✓ answer (2)</p>
<p>6.1.2</p>	$A = P(1-in)$ $A = 150\,000(1-0,09 \times 5)$ $A = 150\,000 - 67\,000$ $A = R82\,500$	<p>✓ substitution into the correct formula                  ✓ answer (2)</p>
<p>6.1.3</p>	$SF = A - T = 205\,513 - 82\,500$ $= R123\,013$ $F = \frac{x[(1+i)^n - 1]}{i}$ $x = \frac{F \times i}{(1+i)^n - 1}$ $x = \frac{123\,013 \times \frac{0,0785}{12}}{\left[\left(1 + \frac{0,0785}{12}\right)^{59} - 1\right] \left(1 + \frac{0,0785}{12}\right)}$ $= R1\,704,01$	<p>✓ answer</p> <p>✓ <math>i = \frac{0,0785}{12}</math>                  ✓ 59 and <math>\left(1 + \frac{0,0785}{12}\right)</math> (A)</p> <p>✓ answer (A) (4)</p>
<p>6.2</p>	$P = \frac{x[1 - (1+i)^{-n}]}{i}$ $200\,000 = \frac{6\,000 \left[1 - \left(1 + \frac{0,0525}{4}\right)^{-4n}\right]}{\frac{0,0525}{4}}$ $\frac{7}{16} = 1 - \left(1 + \frac{0,0525}{4}\right)^{-4n}$ $\frac{9}{16} = \left(\frac{1621}{1600}\right)^{-4n}$ $-4n = \frac{\log \frac{9}{16}}{\log \left(\frac{1621}{1600}\right)}$ $-4n = -44,1243\dots$ $n = 11,03 \text{ years}$	<p>✓ substitution into correct formula</p> <p>✓ simplification</p> <p>✓ use of logs</p> <p>✓ <math>-4n = -44,1243\dots</math></p> <p>✓ <math>n = 11,03 \text{ years}</math> (5)</p>
		<p><b>[13]</b></p>

**QUESTION 7/VRAAG 7**

<p>7.1</p>	$f(x) = -2x^2 - 1$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{-2(x+h)^2 - 1 - (-2x^2 - 1)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{-2x^2 - 4xh - 2h^2 - 1 + 2x^2 + 1}{h}$ $= \lim_{h \rightarrow 0} \frac{-4xh - 2h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-4x - 2h)}{h}$ $= -4x$ <p><b>OR/OF</b></p> $f(x+h) = -2(x+h)^2 - 1$ $f(x+h) = -2x^2 - 4xh - 2h^2 - 1$ $f(x+h) - f(x) = -2x^2 - 4xh - 2h^2 - 1 + 2x^2 + 1$ $f(x+h) - f(x) = -4xh - 2h^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-4xh - 2h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-4x - 2h)}{h}$ $= -4x$	<p>✓ substitution into the correct formula</p> <p>✓ <math>-2x^2 - 4xh - 2h^2 - 1</math></p> <p>✓ <math>-4xh - 2h^2</math></p> <p>✓ common factor</p> <p>✓ answer (5)</p> <p><b>OR/OF</b></p> <p>✓ <math>-2x^2 - 4xh - 2h^2 - 1</math></p> <p>✓ <math>-4xh - 2h^2</math></p> <p>✓ substitution into the correct formula</p> <p>✓ common factor</p> <p>✓ answer (5)</p>
<p>7.2.1</p>	$f(x) = -2x^3 + 3x^2$ $f'(x) = -6x^2 + 6x$	<p>✓ <math>-6x^2</math></p> <p>✓ <math>+6x</math> (2)</p>
<p>7.2.2</p>	$y = 2x + \frac{1}{\sqrt{4x}}$ $y = 2x + \frac{1}{2}x^{-\frac{1}{2}}$ $\frac{dy}{dx} = 2 - \frac{1}{4}x^{-\frac{3}{2}}$	<p>✓ <math>\frac{1}{2}</math> ✓ <math>x^{-\frac{1}{2}}</math></p> <p>✓ <math>2</math> ✓ <math>-\frac{1}{4}x^{-\frac{3}{2}}</math> (4)</p>
<p>7.3</p>	<p><math>x &lt; 1</math></p>	<p>✓✓ answer (2)</p>
<p><b>[13]</b></p>		

**QUESTION 8/VRAAG 8**

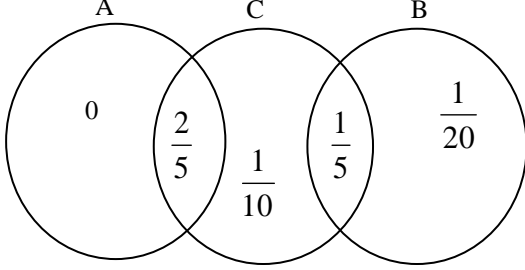
8.1	$y = -10$	✓ answer (1)
8.2	$f(x) = x^3 + 4x^2 - 7x - 10$ $f(2) = 2^3 + 4(2)^2 - 7(2) - 10 = 0$	✓ substitution of $x = 2$ ✓ $f(2) = 0$ (2)
8.3	$f(x) = (x - 2)(x^2 + 6x + 5)$ $f(x) = (x - 2)(x + 5)(x + 1)$	✓ $(x - 2)$ ✓ $(x + 5)$ ✓ $(x + 1)$ (3)
8.4		✓ $x$ - intercepts ✓ $y$ -intercept ✓ sketching the graph with turning points in 2 <sup>nd</sup> and 4 <sup>th</sup> quadrant  (3)
8.5.1	$x \in (-3,4 ; 0,7)$ <b>OR/OF</b> $-3,4 < x < 0,7$	✓✓ $x \in (-3,4 ; 0,7)$ (2)
8.5.2	$f(x) = x^3 + 4x^2 - 7x - 10$ $f'(x) = 3x^2 + 8x - 7$ $f''(x) = 6x + 8 = 0$ $\therefore x = -\frac{8}{6} = -\frac{4}{3} = -1,33$  <b>OR/OF</b> $\frac{-3,4 + 0,7}{2} = -1,35 = -1,35$	✓ $f''(x) = 6x + 8$  ✓ answer (2)  <b>OR/OF</b> ✓ substitution ✓ answer (2)
8.5.3	$x \leq -3,4$ or $-1,33 \leq x \leq 0,7$ <b>OR/OF</b> $x \in (-\infty ; -3,4] \cup [-1,33 ; 0,7]$	✓ $x \leq -3,4$ (A) ✓✓ $-1,33 \leq x \leq 0,7$ (A 0,7) (3)
		<b>[16]</b>

**QUESTION 9/VRAAG 9**

9.1	Perimeter of the square = $12 - 6x$ Side length of square = $\frac{12 - 6x}{4} = \frac{6 - 3x}{2} = 3 - \frac{3}{2}x$	✓ $12 - 6x$ ✓ answer (2)
9.2	$V = \left(\frac{6-3x}{2}\right)^2 (4x)$ $= \left(\frac{36 - 36x + 9x^2}{4}\right)(4x)$ $= 36x - 36x^2 + 9x^3$ $V(x) = 36x - 36x^2 + 9x^3$ $V'(x) = 36 - 72x + 27x^2$ $36 - 72x + 27x^2 = 0$ $9x^2 - 24x + 12 = 0$ $3x^2 - 8x + 4 = 0$ $(3x - 2)(x - 2) = 0$ $x = \frac{2}{3} \quad \text{or} \quad x = 2$ $V\left(\frac{2}{3}\right) = 36\left(\frac{2}{3}\right) - 36\left(\frac{2}{3}\right)^2 + 9\left(\frac{2}{3}\right)^3$ $= \frac{32}{3} \text{ m}^3 = 10,67 \text{ m}^3$	✓ $\left(\frac{6-3x}{2}\right)^2 (4x)$ ✓ $\left(\frac{36 - 36x + 9x^2}{4}\right)$ ✓ $36x - 36x^2 + 9x^3$ ✓ $V'$ ✓ $V' = 0$ ✓ values ✓ answer (7)
		<b>[9]</b>

**QUESTION 10/VRAAG 10**

<p>10.1.1</p>	<p>Event A</p> <p>Event B</p>	<p>✓ Event A</p> <p>✓ Event B Medication: for <math>P(C) = \frac{3}{5}</math></p> <p>✓ Event B sugar pill: for <math>P(NC) = \frac{7}{10}</math></p> <p>(3)</p>
<p>10.1.2</p>	<p><math>P(\text{Not Cured}) = P(H) \times P(NC) + P(S) \times P(NC)</math></p> <p><math>= \left(\frac{1}{2}\right)\left(\frac{2}{5}\right) + \left(\frac{1}{2}\right)\left(\frac{7}{10}\right)</math></p> <p><math>= \frac{11}{20} = 0,55</math></p>	<p>✓ substitution</p> <p>✓ answer (2)</p>
<p>10.2.1</p>	<p><math>P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)</math></p> <p><math>P(A \text{ and } B) = \frac{13}{20} - \frac{2}{5} - \frac{1}{4} = 0</math></p> <p>Events are mutually exclusive</p> <p><b>OR/OF</b></p> <p><math>P(A) + P(B) = \frac{2}{5} + \frac{1}{4}</math></p> <p><math>= \frac{13}{20}</math></p> <p><math>P(A \text{ or } B) = P(A) + P(B)</math></p> <p><math>P(A \text{ and } B) = 0</math></p> <p>Events are mutually exclusive</p>	<p>✓ substitution</p> <p>✓ answer (<math>P(A \text{ and } B) = 0</math>) (2)</p> <p><b>OR/OF</b></p> <p>✓ substitution</p> <p>✓ answer (<math>P(A \text{ and } B) = 0</math>) (2)</p>

<p>10.2.2</p>	<p><math>P(B \text{ and } C) = \frac{1}{5} = 0,2</math></p> <p><math>P(\text{ only } C) = \frac{7}{10} - \frac{2}{5} - \frac{1}{5} = \frac{1}{10} = 0,1</math></p> 	<p>✓ <math>P(B \text{ and } C) = \frac{1}{5}</math> (A)</p> <p>✓ <math>\frac{7}{10} - \frac{2}{5} - \frac{1}{5}</math></p> <p>✓ <math>\frac{1}{10}</math> (3)</p>
<p>10.2.3</p>	<p><math>P(\text{no event}) = 1 - \left( \frac{2}{5} + \frac{1}{10} + \frac{1}{5} + \frac{1}{20} \right) = \frac{1}{4} = 0,25</math></p>	<p>✓ <math>1 - (P(A) \text{ or } P(B) \text{ or } P(C))</math></p> <p>✓ answer (2)</p>
<p>10.3.1</p> <p><math>3! \times 5!</math> <math>= 720</math></p>	<p>Answer only: Full Marks</p>	<p>✓ <math>3!</math></p> <p>✓ <math>3! \times 5!</math> (A) (2)</p>
<p>10.3.2</p>	<p><math>\frac{7! - 6! \times 2}{7!} = \frac{5}{7} = 0,71</math></p> <p><b>OR/OF</b></p> <p><math>1 - \frac{6! \times 2}{7!}</math></p> <p><math>= 1 - \frac{2}{7}</math></p> <p><math>= \frac{5}{7} = 0,71</math></p>	<p>✓ <math>7! - 6! \times 2</math></p> <p>✓ denominator (7!)</p> <p>✓ answer (3)</p> <p><b>OR/OF</b></p> <p>✓ <math>6! \times 2</math></p> <p>✓ denominator (7!)</p> <p>✓ answer (3)</p>
		<p>[17]</p>

**TOTAL/TOTAAL: 150**