VOORBEREIDENDE EKSAMEN

GRAAD 12

WISKUNDE V1

SEPTEMBER 2018

PUNTE: 150

NASIENRIGLYNE

Hierdie nasienriglyn bestaan uit 13 bladsye.
LET WEL:
- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk slegs die EERSTE poging.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die memorandum van toepassing.

VRAAG 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>
| 1.1.1 | \[-3x^2 + 2x + 2 = 0\]  
  \[x = \frac{-2 \pm \sqrt{(2)^2 - 4(-3)(2)}}{2(-3)}\]  
  \[x = -0.55 \text{ of } x = 1.22\]  
  ✓ vervang met korrekte formule  
  ✓ \(x = -0.55\)  
  ✓ \(x = 1.22\)  
  (3) |
| 1.1.2 | \[x^2 + 2x - 3 = 5\]  
  \[x^2 + 2x - 8 = 0\]  
  \[(x + 4)(x - 2) = 0\]  
  \[x = -4 \text{ of } x = 2\]  
  ✓ standaard vorm  
  ✓ faktore  
  ✓ beide \(x\) waardes  
  (3) |
| 1.1.3 | \[x^2 - 2x - 15 \leq 0\]  
  \[(x - 5)(x + 3) \leq 0\]  
  CVs: \(-3 \text{ en } 5\)  
  \[\text{Oplos sin } g : -3 \leq x \leq 5\]  
  ✓ faktore  
  ✓ kritiese waardes  
  ✓ antwoord (notatsie)  
  (3) |
| 1.1.4 | \[-\sqrt{2x - 1} = 2 - x\]  
  \[x - 2 = \sqrt{2x - 1}\]  
  \[x^2 - 4x + 4 = 2x - 1\]  
  \[x^2 - 6x + 5 = 0\]  
  \[(x - 5)(x - 1) = 0\]  
  \[x = 5 \text{ of } x = 1\]  
  \[\therefore x = 5 \text{ slegs}\]  
  ✓ \(x^2 - 4x + 4 = 2x - 1\)  
  ✓ standaard vorm  
  ✓ faktore  
  ✓ \(x = 5\) slegs  
  (4) |
| 1.1.5 | \[7.3^4 - 3^3 = 36\]  
  \[7.3^4 - 3.3^3 = 36\]  
  \[3^4(7 - 3) = 36\]  
  \[3^4(4) = 36\]  
  \[3^4 = 9\]  
  \[3^4 = 3^2\]  
  \[\therefore x = 2\]  
  ✓ \(3^4(7 - 3) = 36\)  
  ✓ \(3^4 = 9\)  
  ✓ \(x = 2\)  
  (3) |
### 1.2

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
<th>Steps</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2x - 1 = y) en (x^2 - xy = 3x - 3)</td>
<td>(x^2 - x(2x - 1) = 3x - 3)</td>
<td>✓ vervanging</td>
<td></td>
</tr>
<tr>
<td>(x^2 - 2x^2 + x = 3x - 3)</td>
<td>✓ standaard vorm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(x^2 + 2x - 3 = 0)</td>
<td>✓ faktore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>((x + 3)(x - 1) = 0)</td>
<td>✓ beide (x)-waardes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(x = -3) of (x = 1)</td>
<td>✓ beide (y)-waardes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(y = -7) of (y = 1)</td>
<td></td>
<td>(5)</td>
<td></td>
</tr>
</tbody>
</table>

### 1.3

<table>
<thead>
<tr>
<th>Expression</th>
<th>Simplification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\sqrt{5}.\sqrt{125} - \frac{5^4.5^{x+1}}{5^{2x}})</td>
<td>(= \sqrt{5}.\sqrt{25.5} - \frac{5^{3x}.5}{5^{2x}})</td>
<td>✓ (5.\sqrt{5}.\sqrt{5})</td>
</tr>
<tr>
<td></td>
<td>(= 5\sqrt{5}.\sqrt{5} - 5)</td>
<td>✓ 5</td>
</tr>
<tr>
<td></td>
<td>(= 25 - 5)</td>
<td>✓ antwoord</td>
</tr>
<tr>
<td></td>
<td>(= 20)</td>
<td></td>
</tr>
</tbody>
</table>
## VRAAG 2

### 2.1 3; −2; −7; −12; ...

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>
| 2.1.1 | \(a = 3\) en \(d = -5\)  
\(T_{21} = 3 + 20(-5)\)  
\(T_{21} = -97\) |
| ✓ korrekte vervanging  
✓ antwoord | (2) |
| 2.1.2 | \(T_n = a + (n-1)d\)  
\(-177 = 3 + (n-1)(-5)\)  
\(-177 = 3 - 5n + 5\)  
\(5n = 185\)  
\(n = 37\) |
| ✓ vervanging  
✓ \(n = 37\) | (2) |

### 2.2 \(S_n = n^2 - 2n\)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.1</td>
<td></td>
</tr>
</tbody>
</table>
| 2.2.1 | \(S_{13} = (13)^2 - 2(13)\)  
\(S_{13} = 143\) |
| ✓ vervanging  
✓ antwoord |
| 2.2.2 | \(S_{12} = (12)^2 - 2(12)\)  
\(S_{12} = 120\)  
\(T_{13} = S_{13} - S_{12}\)  
\(T_{13} = 143 - 120 = 23\) |
| ✓ \(S_{12} = 120\)  
✓ antwoord | (2) |

### 2.3

\[
\begin{align*}
6 - x & = 3  
\Rightarrow x = 3 \\
(y - 12) & = (33 - 2y)  
\Rightarrow y = 15 \\
x + y & = 21
\end{align*}
\]

\[
\begin{align*}
3y & = 45  
\Rightarrow y = 15 \\
x & = 6
\end{align*}
\]

\[
\begin{align*}
\text{Eerste differensie i.t.v. } y \quad & \text{✓}  
\text{Tweede differensie i.t.v. } y \quad & \text{✓}  
\text{gelykstelling van twee differensies} \quad & \text{✓} 
\end{align*}
\]

\[
\begin{align*}
y & = 15  
x + y & = 21
\end{align*}
\] (5)
### VRAAG 3

#### 3.1

<table>
<thead>
<tr>
<th>$S_n = a + ar + ar^2 + \ldots + ar^{n-2} + ar^{n-1}$</th>
<th>$\checkmark S_n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$rS_n = ar + ar^2 + ar^3 + \ldots + ar^{n-1} + ar^n$</td>
<td>$\checkmark rS_n$</td>
</tr>
<tr>
<td>$S_n - rS_n = a - ar^n$</td>
<td>$\checkmark S_n - rS_n = a - ar^n$</td>
</tr>
<tr>
<td>$S_n(1-r) = a(1-r^n)$</td>
<td>$\checkmark S_n(1-r) = a(1-r^n)$</td>
</tr>
<tr>
<td>$\therefore \quad S_n = \frac{a(1-r^n)}{1-r}$</td>
<td>(4)</td>
</tr>
</tbody>
</table>

#### 3.2

| 3.2.1 | $4; \frac{4}{5}; \frac{4}{25}$ | $\checkmark$ antwoord (1) |
| 3.2.2 | $S_n = \frac{a}{1-r}$ | $\checkmark \quad r = \frac{1}{5}$ |
| | $S_n = \frac{4}{1-\frac{1}{5}}$ | $\checkmark$ vervanging met korrekte formule |
| | $S_n = 5$ | $\checkmark$ antwoord (3) |

| 3.2.3 | $S_n - S_n < 0.0001$ | $\checkmark$ opstelling van die ongelykheid |
| | $4 \left[1 - \left(\frac{1}{5}\right)^n\right] < 0.0001$ | $\checkmark$ vervang. $S_n; a \text{ en } r$ |
| | $5 - \frac{1}{1 - \frac{1}{5}} < 0.0001$ | |
| | $4 - 4 + 4(0.2)^n < 0.00008$ | $\checkmark$ $(0.2)^n = 0.00002$ |
| | $(0.2)^n < 0.00002$ | $\checkmark$ korrekte gebruik van logaritmes |
| | $\therefore \quad n > \frac{\log 0.00002}{\log 0.2}$ | |
| | $n > 6.722706232$ | $\checkmark n = 7$ |
| | Kleinste $n = 7$ | (5) |

[13]
### VRAAG 4

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 4.1 | $0 = 4x + 8$  
$-4x = 8$  
$\therefore x = -2$  
$A(-2;0)$ | ✓ $y = 0$  
✓ $x = -2$  
(2) |
| 4.2 | $B(10;0)$ | ✓ $x = 10$  
✓ $y = 0$  
(2) |
| 4.3 | $h(x) = a(x - x_1)(x - x_2)$  
$h(x) = a(x + 2)(x - 10)$  
$32 = a(6 + 2)(6 - 10)$  
$32 = -32a$  
$a = -1$  
$\therefore h(x) = -(x + 2)(x - 10)$  
$h(x) = -x^2 + 8x + 20$ | ✓ vervang $x_1 = -2$ en  
$x_2 = 10$  
✓ vervang $(6;32)$  
✓ $a = -1$  
✓ vergelyking van $h(x)$  
(4) |
| 4.4 | $F(0;8)$ en $C(0;20)$  
$FC = 12$ eenhede | ✓ $F(0;8)$ en $C(0;20)$  
✓ antwoord  
(2) |
| 4.5 | $h(4) = -(4)^2 + 8(4) + 20 = 36$  
Reeks: $y \in (-\infty;36]$  
OF $y / y \in \mathbb{R}; y \leq 36$ | ✓ $y = 36$  
✓ antwoord  
(2) |
| 4.6 | $x \in (10;\infty)$  
OF $x / x \in \mathbb{R}; x > 10$ | ✓ kritiese waardes  
✓ notasie  
(2) |
| 4.7 | $4x + k = -x^2 + 8x + 20$  
$x^2 - 4x + k - 20 = 0$  
$\Delta = b^2 - 4ac$  
$\Delta = (-4)^2 - 4(1)(k - 20)$  
$0 = 16 - 4k + 80$  
$4k = 96$  
$k = 24$  
**OF**  
$h'(x) = f'(x)$  
$-2x + 8 = 4$  
$\therefore x = 2$  
$h(2) = -2^2 + 8(2) + 20 = 32$  
$\therefore (2;32)$  
$32 = 4(2) + k$  
$24 = k$ | ✓ standard vorm  
✓ vervang met $\Delta$  
✓ $\Delta = 0$  
✓ antwoord  
✓ $-2x + 8 = 4$  
✓ $x = 2$  
✓ $h(2) = 32$  
✓ $k = 24$  
(4) |
### VRAAG 5

#### 5.1

<table>
<thead>
<tr>
<th>Expression</th>
<th>Answer 1</th>
<th>Answer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f(x) = \frac{2+x}{x-1}$</td>
<td>$f(x) = \frac{x-1+3}{x-1}$</td>
<td>$\checkmark \frac{x-1+3}{x-1}$</td>
</tr>
<tr>
<td>$f(x) = \frac{x-1+3}{x-1}$</td>
<td>$f(x) = \frac{x-1}{x-1} + \frac{3}{x-1}$</td>
<td>$\checkmark \frac{x-1}{x-1} + \frac{3}{x-1}$</td>
</tr>
<tr>
<td>$f(x) = \frac{x-1}{x-1} + \frac{3}{x-1}$</td>
<td>$f(x) = \frac{3}{x-1} + 1$</td>
<td>$\checkmark \ f(x) = \frac{3}{x-1} + 1$ (3)</td>
</tr>
</tbody>
</table>

#### 5.2

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x = 1$</td>
<td>$x = 1$</td>
</tr>
<tr>
<td>$y = 1$</td>
<td>$y = 1$</td>
</tr>
</tbody>
</table>

#### 5.3

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 = \frac{2+x}{x-1}$</td>
<td>$\checkmark y = 0$</td>
</tr>
<tr>
<td>$0 = 2 + x$</td>
<td>$\checkmark x = -2$ (2)</td>
</tr>
<tr>
<td>$x = -2$</td>
<td></td>
</tr>
<tr>
<td>$A(-2; 0)$</td>
<td></td>
</tr>
</tbody>
</table>

#### 5.4

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x = 3$</td>
<td>$\checkmark$ antwoord (1)</td>
</tr>
</tbody>
</table>

[8]
### VRAAG 6

**6.1**

\[ f(x) = \left( \frac{1}{3} \right)^x \]

**6.1.1**

\[ x = \left( \frac{1}{3} \right)^y \]

\[ f^{-1}(x) = \log_{\frac{1}{3}} x \quad \text{OF} \quad f^{-1}(x) = -\log_{\frac{1}{3}} x \]

\[ \text{OF} \quad f^{-1}(x) = -\log_{\frac{1}{3}} x \]

\[ \text{OF: } f^{-1}(x) = -\log_{\frac{1}{3}} x \]

\[ x = \left( \frac{1}{3} \right)^y \quad \text{antwoord} \]

**6.1.2**

\[ f(x) = \left( \frac{1}{3} \right)^x : \]

\[ \text{vorm} \]

\[ \text{y-afsnit} \]

\[ f^{-1}(x) = \log_{\frac{1}{3}} x: \]

\[ \text{vorm} \]

\[ \text{x-afsnit} \]

**6.2**

\[ p(-3) = 10 \quad \text{en} \quad p'(x) = -2 \]

\[ p(x) = -2x + c \]

\[ 10 = -2(-3) + c \]

\[ \therefore c = 16 \]

\[ p(x) = y = -2x + 16 \]

\[ x = -2y + 16 \]

\[ p^{-1}(x) = -\frac{1}{2}x + 8 \]

\[ \text{omruil van } x \text{ en } y \]

\[ (x = -2y + 16) \]

\[ \text{antwoord} \]

\[ m = -2 \]

\[ c = 16 \]

\[ \text{antwoord} \]

\[ \text{Slegs Antwoord: Volpunte} \]
### VRAAG 7

#### 7.1

\[ 1 + i_{\text{eff}} = \left( 1 + \frac{i_{\text{nom}}}{n} \right)^n \]

\[ 1 + i_{\text{eff}} = \left( 1 + \frac{0.096}{12} \right)^{12} \]

\[ \therefore i_{\text{eff}} = 0.100338694 \]

\[ \therefore r_{\text{eff}} = 10.03\% \]

- Vervang met korrekte formule
- Antwoord \((i\text{ of }r)\)

#### 7.2

\[ A = P (1 - i)^n \]

\[ 60\ 000 = 150\ 000 \left( 1 - \frac{0.88}{4} \right)^n \]

\[ 0.4 = (0.978)^n \]

\[ \therefore n = \frac{\log 0.4}{\log 0.978} \]

\[ n = 41.19797 \ldots \text{ kwarte } = 10.3 \text{ jare} \]

- Vervang met korrekte formule
- Korrekte gebruik van logaritmes
- Antwoord

#### 7.3

#### 7.3.1

\[ p = \frac{x[1-(1+i)^{-n}]}{i} \]

\[ R250\ 000 = \frac{0.1\ 120}{0.1\ 12} \]

\[ \therefore x = R3\ 303.77 \]

- Opstel van formule
- Antwoord

#### 7.3.2

Uitstaande balans (B):

\[ B = \frac{R3\ 303.77 \left[ 1 - \left( 1 + \frac{0.1}{12} \right)^{-84} \right]}{0.1\ 12} \]

\[ B = R199\ 008.09 \]

OF

Uitstaande Balans (B):

\[ B = 250\ 000 \left( 1 + \frac{0.1}{12} \right)^{36} - \frac{3\ 303.77 \left[ \left( 1 + \frac{0.1}{12} \right)^{36} - 1 \right]}{0.1\ 12} \]

\[ B = R199\ 007.93 \]

- Opstel van formule
- Antwoord

[14]
### VRAAG 8

**8.1** \( f(x) = -3x^2 \)

\[
f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}
\]

\[
f'(x) = \lim_{h \to 0} \frac{-3(x+h)^2 - (-3x^2)}{h}
\]

\[
f'(x) = \lim_{h \to 0} \frac{-3x^2 - 6xh - 3h^2 + 3x^2}{h}
\]

\[
f'(x) = \lim_{h \to 0} \frac{-6xh - 3h^2}{h}
\]

\[
f'(x) = \lim_{h \to 0} \frac{h(-6x - 3h)}{h}
\]

\[
f'(x) = -6x
\]

✓ vervang met korrekte formule

\[
\]  

**8.2** \( y = 7x^4 - 5\sqrt{x} - \frac{3}{x} \)

\[
y = 7x^4 - 5x^{\frac{1}{2}} - 3x^{-1}
\]

\[
dy
\]

\[
dx = 28x^3 - 5 \cdot x^{-\frac{1}{2}} + 3x^{-2}
\]

✓ vervanging

\[
\]  

**8.3** \( g(x) = ax^3 - 24x + b \)

\[
g'(x) = 3ax^2 - 24
\]

\[
0 = 3a(-2)^2 - 24
\]

\[
a = 2
\]

\[
17 = 2(-2)^3 - 24(-2) + b
\]

\[
17 = -16 + 48 + b
\]

\[
b = -15
\]

✓ vervanging

\[
\]  

### Antwoord (4)

<table>
<thead>
<tr>
<th>Vraag</th>
<th>Gemaklikheid</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>✓</td>
</tr>
<tr>
<td>8.2</td>
<td>✓</td>
</tr>
<tr>
<td>8.3</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Totale punte</th>
<th>13</th>
</tr>
</thead>
</table>
### VRAAG 9

<table>
<thead>
<tr>
<th>9. 1</th>
<th>( f(x) = -x^3 + 10x^2 - 17x - 28 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( y)-afsnit: ((0; -28))</td>
</tr>
<tr>
<td></td>
<td>( x)-afsnit: ((x + 1)(x^2 - 11x - 28) = 0)</td>
</tr>
<tr>
<td></td>
<td>((x + 1)(x - 7)(x - 4) = 0)</td>
</tr>
<tr>
<td></td>
<td>( x = -1 ) of ( x = 7 ) of ( x = 4 )</td>
</tr>
<tr>
<td></td>
<td>((-1; 0); (7; 0); (4; 0))</td>
</tr>
<tr>
<td></td>
<td>✓ ((0; -28))</td>
</tr>
<tr>
<td></td>
<td>✓ ✓ ((x + 1)(x^2 - 11x - 28) = 0)</td>
</tr>
<tr>
<td></td>
<td>✓ ((x + 1)(x - 7)(x - 4) = 0)</td>
</tr>
<tr>
<td></td>
<td>✓ ( x)-waardes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. 2</th>
<th>( f(x) = -x^3 + 10x^2 - 17x - 28 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( 0 = -3x^2 + 20x - 17 )</td>
</tr>
<tr>
<td></td>
<td>( 0 = 3x^2 - 20x + 17 )</td>
</tr>
<tr>
<td></td>
<td>( 0 = (3x - 17)(x - 1) )</td>
</tr>
<tr>
<td></td>
<td>( \therefore x = \frac{17}{3} ) or ( x = 1 )</td>
</tr>
<tr>
<td></td>
<td>Draaipunte: ( \left(\frac{17}{3}; 14.8\right) ) en ( (1; -36) )</td>
</tr>
<tr>
<td></td>
<td>✓ ( 0 = -3x^2 + 20x - 17 )</td>
</tr>
<tr>
<td></td>
<td>✓ faktore</td>
</tr>
<tr>
<td></td>
<td>✓ beide ( x)-waardes</td>
</tr>
<tr>
<td></td>
<td>✓ ( \left(\frac{17}{3}; 14.8\right) )</td>
</tr>
<tr>
<td></td>
<td>✓ ( (1; -36) )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. 3</th>
<th>( \frac{y}{1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( (5; 14.8) )</td>
</tr>
<tr>
<td></td>
<td>✓ vorm</td>
</tr>
<tr>
<td></td>
<td>✓ draaipunt</td>
</tr>
<tr>
<td></td>
<td>✓ ( x) - en ( y)-afsnitte</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. 4</th>
<th>( k - 3 &gt; 14.8 ) or ( k - 3 &lt; -36 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓ ( k &gt; 17.8 )</td>
</tr>
<tr>
<td></td>
<td>( k &gt; 17.8 ) or ( k &lt; -33 )</td>
</tr>
<tr>
<td></td>
<td>✓ ( k &lt; -33 )</td>
</tr>
</tbody>
</table>

\[15\]
### VRAAG 10

<table>
<thead>
<tr>
<th>10.1</th>
<th>( \tan 60^\circ = \frac{DE}{x} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \therefore DE = x\sqrt{3} )</td>
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<td></td>
<td>( EF = y - 2x )</td>
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<td></td>
<td>Oppvl van reghoek = basis (\times) hoogte</td>
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<td></td>
<td>[ = (y - 2x)x\sqrt{3} ]</td>
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<td>[ = \sqrt{3}xy - 2\sqrt{3}x^2 ]</td>
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<tr>
<th>10.2</th>
<th>( A = \sqrt{3}xy - 2\sqrt{3}x^2 )</th>
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<tr>
<td></td>
<td>( \frac{dA}{dx} = \sqrt{3}y - 4\sqrt{3}x = 0 )</td>
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<td></td>
<td>( \therefore x = \frac{y}{4} )</td>
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<tr>
<td></td>
<td>( MaksOppvl = \sqrt{3}\left(\frac{y}{4}\right)y - 2\sqrt{3}\left(\frac{y}{4}\right)^2 )</td>
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<td></td>
<td>[ = \frac{\sqrt{3}y^2}{4} - \frac{2\sqrt{3}y^2}{16} ]</td>
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<td></td>
<td>[ = \frac{\sqrt{3}}{8}y^2 ]</td>
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\[ \checkmark \tan 60^\circ = \frac{DE}{x} \]
\[ \checkmark DE = x\sqrt{3} \]
\[ \checkmark EF = y - 2x \]
\[ \checkmark (y - 2x)x\sqrt{3} \]  \( (4) \)

\[ \checkmark \frac{dA}{dx} = \sqrt{3}y - 4\sqrt{3}x \]
\[ \checkmark \frac{dA}{dx} = 0 \]
\[ \checkmark x = \frac{y}{4} \]
\[ \checkmark \text{Vervanging } x = \frac{y}{4} \]
\[ \checkmark \text{antwoord} \]  \( (5) \)

\[ [9] \]
## VRAAG 11

### 11.1

11.1.1  \[ P(A) = 0,45 \]
\[ P(A \text{ of } B) = P(A) + P(B) \]
\[ = 0,45 + 0,29 \]
\[ = 0,74 \]

✓ vervanging
✓ antwoord  

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<tr>
<td>∴</td>
<td></td>
<td>P(A) = 0,45</td>
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<tr>
<td>P(A \text{ of } B) = P(A) + P(B)</td>
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<td>= 0,45 + 0,29</td>
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<td>= 0,74</td>
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### 11.1.2  

\[ P(A \text{ of } B) = P(A) + P(B) - P(A \text{ en } B) \]
\[ = 0,45 + 0,29 - 0,1276 \]
\[ = 0,0695 \approx 0,61 \]

✓ vervanging
✓ antwoord

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<td></td>
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<td>P(A \text{ of } B) = P(A) + P(B) - P(A \text{ en } B)</td>
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<td>= 0,45 + 0,29 - 0,1276</td>
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<td>= 0,0695 \approx 0,61</td>
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### 11.2

- **P(speel nie sokker nie) =**
  \[ \frac{1}{3} \times \frac{1}{5} + \frac{2}{3} \times \frac{3}{5} = \frac{7}{15} \]

✓ vervanging
✓ antwoord

### 11.3  

Aantal verskillende kodes = 26 \times 9 \times 8 \times 7 = 13104

✓ vervanging
✓ antwoord

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<td>P(speel nie sokker nie) =</td>
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<tr>
<td></td>
<td></td>
<td>[ \frac{1}{3} \times \frac{1}{5} + \frac{2}{3} \times \frac{3}{5} = \frac{7}{15} ]</td>
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### TOTAAL: 150