### QUESTION/VRAAG 1

#### 1.1.1
\[
\begin{align*}
    x^4 - 81 &= (x^2 - 9)(x^2 + 9) \\
    &= (x - 3)(x + 3)(x^2 + 9) \\
    \checkmark\quad \checkmark \\
\end{align*}
\]
\[
\begin{align*}
    x^4 - 81 &= (x^2 - 9)(x^2 + 9) \\
    &= (x - 3)(x + 3)(x^2 + 9) \\
    \checkmark\quad \checkmark
\end{align*}
\]

#### 1.1.2
\[
\begin{align*}
    6x^2y - 10xy + 15x - 25 &= 2xy(3x - 5) + 5(3x - 5) \\
    &= (2xy + 5)(3x - 5) \\
    \checkmark\quad \checkmark\quad \checkmark
\end{align*}
\]

**OR/OOR**
\[
\begin{align*}
    6x^2y - 10xy + 15x - 25 &= 3x(2xy + 5) - 5(2xy + 5) \\
    &= (2xy + 5)(3x - 5) \\
    \checkmark\quad \checkmark\quad \checkmark
\end{align*}
\]

#### 1.2.1
\[
\begin{align*}
    \frac{3}{a - 4} + \frac{2}{a + 3} - \frac{21}{a^2 - a - 12} &= \frac{3}{a - 4} + \frac{2}{a + 3} - \frac{21}{(a - 4)(a + 3)} \\
    &= \frac{3(a + 3) + 2(a - 4) - 21}{(a - 4)(a + 3)} \\
    &= \frac{3a + 9 + 2a - 8 - 21}{(a - 4)(a + 3)} \\
    &= \frac{5a - 20}{(a - 4)(a + 3)} \\
    &= \frac{5}{a - 4} \quad \checkmark\quad \checkmark\quad \checkmark
\end{align*}
\]

**Answer/antwoord**

---

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### QUESTION/VRAAG 2

#### 2.1.1

\[
15x^2 - 14x - 8 = 0 \\
(5x + 2)(3x - 4) = 0 \\
5x + 2 = 0 \quad \text{or} \quad 3x - 4 = 0
\]

- \( x = \frac{-2}{5} \) \( \checkmark \) or \( x = \frac{4}{3} \) \( \checkmark \)

- \( \text{standard form/standaardvorm} \)
- \( \text{factorisation/faktoriserings} \)
- \( \text{answers/antwoorde} \)

#### 2.1.2

\[
5^x = \frac{1}{125} \\
5^x = \frac{1}{5^3} \\
5^x = 5^{-3} \\
x = -3
\]

- \( \checkmark \)
- \( \checkmark \)
- \( \checkmark \)

- \( 5^{-3} \)
- \( \text{answer/antwoord} \)

#### 2.2.1

\[
3(x + 7) < \frac{x}{2} + 1 \\
3x + 21 < \frac{x}{2} + 1 \\
6x + 42 < x + 2 \\
5x < -40 \\
x < -8
\]

- \( \frac{3x - \frac{1}{2}x}{3} < 20 \)
- \( \frac{5x}{2} < -20 \)
- \( x < \frac{-20}{5/2} \)
- \( x < -8 \)

- \( \text{answer/antwoord} \)

- \( 3x + 21 \)
- \( 6x + 42 < x + 2 \)

- \( \text{answer/antwoord} \)
### QUESTION/FRAAG 3

<table>
<thead>
<tr>
<th>3.1.1</th>
<th>$-7; -12$</th>
<th>$\sqrt{7}; \sqrt{12}$</th>
<th>$\sqrt{-7}; \sqrt{-12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.2</td>
<td>$T_n = -5n + 13$</td>
<td>$T_n = 8 + (n - 1)(-5)$</td>
<td>$-5n$ $13$</td>
</tr>
<tr>
<td>3.1.3</td>
<td>$T_n = -5n + 13$</td>
<td>$T_{30} = -5(30) + 13$</td>
<td>$-5n + 13 = -492$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$= -137$</td>
<td>$n = 30$</td>
</tr>
<tr>
<td></td>
<td>$-5n + 13 = -492$</td>
<td>$-5n = -505$</td>
<td>$n = 101$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$n = 101$</td>
<td>$\sqrt{2n}$ $\sqrt{-1}$</td>
</tr>
<tr>
<td>3.2.1</td>
<td>$T_n = \frac{2n - 1}{2}$</td>
<td>$T_n = \frac{2n - 1}{2}$</td>
<td>$2n$ $-1$</td>
</tr>
<tr>
<td></td>
<td>$= 4n^2 - 4n + 1$</td>
<td>$= 4n^2 - 4n + 1$</td>
<td>$\sqrt{(2n-1)^2}$</td>
</tr>
<tr>
<td>3.2.3</td>
<td>$T_n = (2n - 1)^2 - (2n - 1)^2$</td>
<td>$= 2n - 1 - (4n^2 - 4n + 1)$</td>
<td>$\sqrt{(2n-1)^2 - (2n-1)^2}$</td>
</tr>
<tr>
<td></td>
<td>$= 2n - 1 - 4n^2 + 4n - 1$</td>
<td>$\geq 4n^2 + 4n - 1$</td>
<td>$\geq 4n^2 + 4n - 1$</td>
</tr>
<tr>
<td></td>
<td>$= -4n^2 + 6n + 2$</td>
<td>$\geq 4n^2 + 4n - 1$</td>
<td>$\geq 4n^2 + 4n - 1$</td>
</tr>
</tbody>
</table>

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QUESTION/VRAAG 4

4.1 \( y = 1 \)

4.2

\[ \text{Graph of } f(x) \text{ and } g(x) \]

\( f: \)
- shape of \( f/vorm \) van \( f \)
- \( x \)-intercepts of \( f/\text{x-asnittie van } f \)
- \( y \)-intercept (TP) of \( f/y \)-asniet (DP) van \( f \)

\( g: \)
- shape of \( g/vorm \) van \( g \)
- asymptote of \( g/\text{asimptoot van } g \)
- \( y \)-intercept of \( g/\text{y-asniet van } g \)

4.3 Range of \( f/\text{Waardeversameling van } f \): \( y \in (-\infty; 2] \)

\( \text{OR/OF} \)

Range of \( f/\text{Waardeversameling van } f \): \( y \leq 2 \)

4.4 Maximum of \( 3f(x) \) will be obtained when \( f(x) \) is at maximum.
Max of \( f(x) \) is 2
Max of \( h \) will be \( 3^2 = 9 \)

Maksimum van \( 3f(x) \) sal verkry word wanneer \( f(x) \) by maksimum is.
Maks \( f(x) \) is 2
Maks \( h \) sal \( 3^2 = 9 \) wees.

4.5 \( f \) would have been reflected in the \( x \)-axis.
\( f \) sou in die \( x \)-as gereflekteer gewees het

\( \text{Reflected/gerelfekteer in the } x \text{-axis/ in die } x \text{-as} \)

[12]
### QUESTION/VRAAG 5

#### 5.1

**a = gradient of g**

\[
\begin{align*}
4 - (-4) &= 8 \\
3 - (-1) &= 4 \\
= 2 \\
-4 &= 2(-1) + q \\
q &= -2 \\
g(x) &= 2x - 2
\end{align*}
\]

**OR/OF**

\[
\begin{align*}
a &= \text{gradient of } g \\
4 &= 3a + q \\
-4 &= -a + q \\
1 - 2: \\
8 &= 4a \\
a &= 2
\end{align*}
\]

Substitute in 1/Substitusie in 1:

\[
\begin{align*}
4 &= 3(2) + q \\
q &= -2 \\
g(x) &= 2x - 2
\end{align*}
\]

**5.2**

\[
\begin{align*}
\frac{1}{x} &= 2x - 2 \\
\frac{1}{x} &= 2x - 1 \\
1 &= 2x^2 - x \\
2x^2 - x - 1 &= 0 \\
(2x + 1)(x - 1) &= 0 \\
x &= -\frac{1}{2} \quad \text{or} \quad x = 1
\end{align*}
\]
5.3 \[ -\frac{1}{2} \leq x < 0 \quad \text{or/af} \quad x \geq 1 \]

\[ x \in \left[ -\frac{1}{2}; 0 \right) \cup \left[ 1; \infty \right) \]

\( \sqrt{3} \)

\( \sqrt{x \geq \frac{1}{2}} \)
\( \sqrt{x < 0} \)
\( \sqrt{x \geq 1} \)
\( \sqrt{-0.5} \)
\( \sqrt{0} \)
\( \sqrt{[1; \infty)} \)

(3)

5.4 \[ f(3) = \frac{1}{3} - 1 = \frac{2}{3} \]

Length of BE = \( 4 - f(3) \)
\[ = 4 - \left( \frac{2}{3} \right) \]
\[ = 4 + \frac{2}{3} \]
\[ = \frac{14}{3} \]

\( \sqrt{3} \)

\[ 4, 6, 7 \]

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

\( (x = 3) \)
\[ \text{BE} = \frac{2(3)^2 - (3) - 1}{3} \]
\[ = \frac{18 - 4}{3} \]
\[ = \frac{14}{3} \]

\( \sqrt{3} \)

(3)

5.5 \[ h(x) = f(x) + 3 \]
\[ h(x) = \frac{1}{x} + 2 \]

\( \sqrt{3} \)

\( \sqrt{\text{answer/antwoord}} \)

(1)

(13)
**QUESTION/VRAAG 6**

6.1 \[ d - 5 + d - 1 = 0 \]
\[ 2d = 6 \]
\[ d = 3 \]

6.2 \[ y = a(x - 2)(x + 2) \]
\[ -9 = a(1 - 2)(1 + 2) \]
\[ -9 = a(-1)(3) \]
\[ -3a = -9 \]
\[ a = 3 \]
\[ f(x) = 3(x^2 - 4) \]
\[ = 3x^2 - 12 \]
\[ c = -12 \]

\[ y = a(x - 2)(x + 2) \]
\[ \text{Sub } (1; -9) \]
\[ f(1) = -9 \]
\[ f(x) = y \]
\[ x = 1 \]
\[ y = -9 \]

\[ c = -12 \]

**QUESTION/VRAAG 7**

7.1 \[ \frac{R 5000}{9,518569 \text{ rand per dollar}} = \$525,29 \]

OR/OF

R 5000 × 0,105058 dollars per rand = $525,29

7.2.1 \[ A = P(1 + i)^n \]
\[ = 5000(1 + 0,061)^3 \]
\[ = R 5971,95 \]

Simple interest \[ \rightarrow 0 \]

7.2.2 Let the amount that Zach invests each year be \[ x/\text{Laat die bedrag wat Zach elke jaar belê, } x \text{ wees.} \]
\[ x(1 + 0,09)^2 + x(1 + 0,09) = 5980 \]
\[ x[1,09^2 + 1,09] = 5980 \]
\[ x = \frac{5980}{1,09^2 + 1,09} \]
\[ = R 264,99 \]

OR/OF

Let the amount that Zach invests each year be \[ x/\text{Laat die bedrag wat Zach elke jaar belê, } x \text{ wees.} \]
\[ [x(1 + 0,09)^3 + x(1 + 0,09)^2] = 5980 \]
\[ x(2,09)(1,09) = 5980 \]
\[ x = \frac{5980}{(2,09)(1,09)} \]
\[ = R 264,99 \]
QUESTION/FRAAG 8

8.1.1

Soccer/sokker (24)  
Rugby (28)

14  
10  
18  
22

8.1.2

(a) \( P(\text{Soccer and Rugby}) = \frac{10}{64} = \frac{5}{32} = 0.15625 = 15.63\% \)

(b) \( P(\text{Soccer or Rugby}) = \frac{14 + 10 + 18}{64} = \frac{42}{64} = \frac{21}{32} = 0.65625 = 65.63\% \)

\( \text{OR / OF} \)

\( P(\text{Soccer or Rugby}) = 1 - \frac{22}{64} = \frac{21}{32} \)

8.1.3

No/Nee. 
Some boys play both soccer and rugby/Party seuns speel sokker en rugby.

\( \text{OR / OF} \)

No/Nee

\( P(S \text{ and } R) \neq 0 / P(S \text{ en } R) \neq 0 \)

8.2

\( P(\text{more than 2 passengers per car}) / P(\text{meer as 2 passasiers per kar}) \)

\( = \frac{5 + 1}{7 + 11 + 6 + 5 + 1} = \frac{6}{30} = \frac{1}{5} = 0.2 = 20\% \)

8.3

\( P(\text{not getting a six}) / P(\text{nie 'n ses kry nie}) \)

\( = 1 - \left( \frac{10}{36} + \frac{1}{36} \right) = \frac{25}{36} \)

\( \text{OR} \)

\( \begin{array}{cccccccc}
1,1 & 1,2 & 1,3 & 1,4 & 1,5 & 1,6 \\
2,1 & 2,2 & 2,3 & 2,4 & 2,5 & 2,6 \\
3,1 & 3,2 & 3,3 & 3,4 & 3,5 & 3,6 \\
4,1 & 4,2 & 4,3 & 4,4 & 4,5 & 4,6 \\
5,1 & 5,2 & 5,3 & 5,4 & 5,5 & 5,6 \\
6,1 & 6,2 & 6,3 & 6,4 & 6,5 & 6,6 \\
\end{array} \)

\( \sqrt{\frac{10}{36} + \frac{1}{36}} \)

\( \sqrt{1 - \frac{10}{36} + \frac{1}{36}} \)

\( \sqrt{\frac{25}{36}} \)

TOTAL/TOTAAL: 100