higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT (BEROEPSGERIG)

WISKUNDE
(Eerste vraestel)
NKR-VLAK 2

9 November 2023

Hierdie nasienriglyn bestaan uit 7 bladsye.

Kopiereg voorbehou

VRAAG 1
LET WEL: Heelpunt ✓
Halfpunt √

1.1 1.1.1 Slegs antwoord, heelpunt
0,58
$\frac{58}{100}$ √ $\frac{29}{50}$ √ (1)

1.1.2 $0,\dot{4}8\dot{6}$
Vergelyking 1: $x = 0{,}486486486\ldots$ √
Vergelyking 2: $1000x = 486{,}486486486\ldots$ √

Vergelyking 2 - Vergelyking 1 : $999x = 486$
$\therefore x = \frac{486}{999}$ √
$= \frac{18}{37}$ √ (2)

1.2 1.2.1
$\frac{27r^{-3}s^{-2}}{3^{-(-2)}r^2 \times 3s^{-3}}$
$= \frac{3^3r^{-3}s^{-2}\ \sqrt{}}{3^2r^2\ \times\ 3s^{-3}\ \sqrt{}}$
$= 3^{3-(2+1)}r^{-3\ -2}\ s^{-2\ -(-3)}$ ✓
$= 3^0r^{-5}s^1$
$= \frac{s}{r^5}$ ✓ (3)

1.2.2
$5s^2(r^0s^0)^8\ \times\ 3 \times \sqrt[3]{\frac{64\,r^9}{729\,r^3s^6}}$
$= 5s^2(1 \times 1)^8$✓ $\times 3 \times \frac{\sqrt[3]{4^3} \times \sqrt[3]{r^9}}{\sqrt[3]{9^3} \times \sqrt[3]{r^3} \times \sqrt[3]{s^6}}$ ✓
$= 5s^2\ \times 3 \times \frac{4 \times r^3}{9 \times r \times s^2}$ ✓
$= \frac{20r^2}{3}$ ✓ (4)

1.3 $\frac{\sqrt{125}\ +\ \sqrt{45}\ -\ \sqrt{20}}{2\sqrt{80}}$
$= \frac{5\sqrt{5} + 3\sqrt{5} - 2\sqrt{5}}{8\sqrt{5}}$ ✓
$= \frac{6\sqrt{5}}{8\sqrt{5}}$ ✓
$= \frac{3}{4}$ ✓ (3)

1.4
$$\frac{\sqrt{36a^2}}{\sqrt{5}-\sqrt{6}}$$
$$= \frac{\sqrt{36a^2}}{\sqrt{5}-\sqrt{6}} \times \frac{\sqrt{5}+\sqrt{6}}{\sqrt{5}+\sqrt{6}} \checkmark$$
$$= \frac{6a(\sqrt{5}+\sqrt{6})}{5+\sqrt{5}\sqrt{6}-\sqrt{5}\sqrt{6}-6} \checkmark$$
$$= \frac{6a\sqrt{5}+6a\sqrt{6}}{-1} \checkmark$$
$$= -6a\sqrt{5}-6a\sqrt{6} \checkmark \quad (4)$$

1.5 1.5.1
$$Z = \frac{2pq}{r+2}$$
$$Z(r+2) = 2pq \checkmark$$
$$q = \frac{Z(r+2)}{2p} \checkmark$$
$$= \frac{Zr+2Z}{2p}$$
$$= \frac{Zr}{2p} + \frac{Z}{p} \quad (2)$$

1.5.2
$$q = \frac{Zr}{2p} + \frac{Z}{p}$$
$$= \frac{(20)(4)}{2(10)} + \frac{20}{(10)} \checkmark \quad \text{(Vervanging in enige vergelyking)}$$
$$= 6 \checkmark \quad (2)$$

1.6 Data: $S_{16} = 166;\ n = 16;\ d = 3;\ a = ?$

$$S_n = \frac{n}{2}[2a + (n-1)d]$$
$$166 = \frac{16}{2}[2a + (16-1)(3)] \checkmark$$
$$166 = 8(2a + 45) \checkmark$$
$$166 = 16a + 360$$
$$-194 = 16a \checkmark$$
$$a = -12.125 \checkmark \quad (4)$$

1.7 1.7.1 -2 ✓ (1)

1.7.2 $a = 7; d = -3;\ T_n = -26\ en\ n = ?$
$$T_n = a + (n-1)d \checkmark$$
$$-26 = 7 + (n-1)(-3) \checkmark$$
$$-26 = 7 - 3n + 3$$
$$-3n = -26 - 7 - 3 \checkmark$$
$$-3n = -36$$
$$n = \frac{-36}{-3} = 12 \checkmark \quad (4)$$

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Kopiereg voorbehou

VRAAG 2

2.2 2.1.1 Kwadratiese funksie (1)

2.1.2 Kontinu (1)

2.1.3 $x = 0\ of\ y - axis$ (1)

2.1.4 Funksie: ✓ Dit is 'n een-tot-een-funksie.
- vir elke x-waarde is daar een y-waarde
- die vertikalelyntoets sny die grafiek op net een punt.✓ (2)

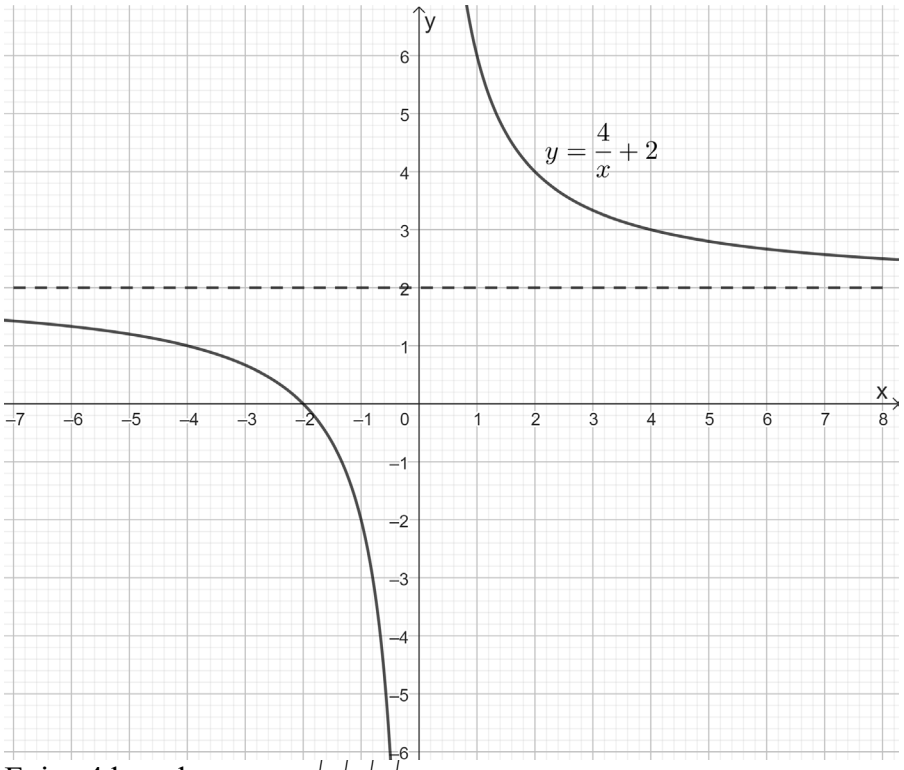
2.1.5 Domein: $(-\infty;\infty)$✓
Waardegebied: $(0\ ;\ \infty)$ ✓ (2)

2.1.6 y-afsnit = 0✓ (1)

2.1.7 $g(x) = x^2 - 1$ ✓✓ (2)

2.2 2.2.1 Hiperbool✓ (1)

2.2.2



Enige 4 korrekte punte √ √ √ √
Asimptoot ✓
Vorm ✓ (4)

2.2.3 $y\ \in (-\infty\ ;\ \infty)\ maar\ y\ \neq 2$✓ (1)

2.2.4 Die grafiek is diskontinu✓ (1)

Kopiereg voorbehou

2.3 Vervang punt (2;1) in die standaardvergelyking:

$y = ax^2 + q$

$1 = a(2)^2 + q$✓

$\therefore 1 = 4a + q \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (A)$✓

Vervang punt (2;1) in die standaardvergelyking:

$y = ax^2 + q$

$4 = a(-1)^2 + q$✓

$\therefore 4 = a + q \ldots\ldots\ldots\ldots\ldots\ldots\ldots (B)$✓

Vergelyking (B) − (A):

$3 = -3a$ ✓

$a = -1$✓

Vervang $a = -1$ in vergelyking (A)

$1 = 4(-1) + q$

$q = 4 + 1)$

$q = 5$ ✓

$\therefore$ Die vergelyking van die parabool is: $y = -x^2 + 5$ ✓ (8)

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VRAAG 3

3.1.1 $(r + s - 1)(r + s)$

$= r^2 + rs + rs + s^2 - r - s$

√ √ √ √

$= r^2 + s^2 + 2rs - r - s$ (2)

3.1.2 $(p^3 - 1)^2 - 3p^3(p^3 + 2) - 6p^6$

√ √ √ √

$= p^6 - 2p^3 + 1 - 3p^6 - 6p^3 - 6p^6$

√ √

$= -8p^6 - 8p^3 + 1$ (3)

3.1.3 $(a^3)^2 \times a^4$

$= a^6 \times a^4$✓

$= a^{10}$✓ (2)

3.2 3.2.1 $2 - 32p^2$

√ √

$= 2(1 - 16p^2)$ Halfpunt vir elke faktor

√ √

$= 2(1 - 4p)(1 + 4p)$ Halfpunt vir elke faktor (2)

Kopiereg voorbehou

3.2.2 $6(p-q)+9p(q-p)$

$= 6(p-q) - 9p(p-q)$ ✓✓ Halfpunt: Verander teken en Halfpunt: Ruil om

$= (6-9p)(p-q)$

$= 3(2-3p)(p-q)$ √ √ (4)

3.3 3.3.1 $p^{3x-6} = 1$

$p^{3x-6} = p^0$ ✓

$3x - 6 = 0$ √

$3x = 6$

$x = 2$ √ (2)

3.3.2 $\frac{x+4}{2} = \frac{2x+7}{3}$

$3(x+4) = 2(2x+7)$✓

$3x + 12 = 4x + 14$

$3x - 4x = 14 - 12$✓

$-x = 2$

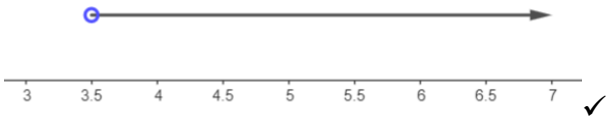
$\therefore x = -2$✓ (3)

3.4 $2(3x-1) > 4x+5$

$6x - 2 > 4x + 5$✓

$2x > 7$

$x > \frac{7}{2}$✓



✓ (3)

3.5 $4x - 1 = y$ ... ... (A) √

$-x + 1 = y$ ... ... (B) √

Laat vergelyking (A) = Vergelyking (B)

$4x - 1 = -x + 1$ ✓

$5x = 2$

$x = \frac{2}{5}$ ✓

Verv. $x = \frac{2}{5}$ *in* (A)

$4(\frac{2}{5}) - 1 = y$

$y = \frac{8}{5} - 1 = 0.6$ ✓ (4)

[25]

Kopiereg voorbehou

VRAAG 4

4.1
4.1.1 D
4.1.2 E
4.1.3 F
4.1.4 G
4.1.5 A
4.1.6 C

(6 × 1) (6)

4.2
A R332,50
B R105,00
C R1 350,00
D R400,00
E R1 077,50 (5)

4.3 Deposito = 10% van R19 000

$= \frac{10}{100} \times$ R 19000

$= R\ 1900$ ✓

Bedrag gefinansier = R19 000 – R1 900 = R17 100 ✓

$A = P\ (1 + in)$

$= 17100\ [1 + (0{,}12 \times 3)]$ √

$=$ R 23256 √

Totale bedrag betaal $=$ R 1900 + R 23256 + R$(35 \times 3 \times 12)$ ✓ 1 punt vir totale versekering

= R26 416 ✓ (5)

4.4 $A = P(1 + i)^n$

$1\ 466 = 1300(1 + i)^3$√

$\frac{1\ 466}{1\ 300} = (1 + i)^3$√

$1.12769 = (1 + i)^3$ √

$1 + i = \sqrt[3]{1.12769}$ √

$1 + i = 1.0408702036$ √

$i = 0.0409$√

$r = 0.0409 \times 100 = 4.09\%$ ✓

(4)
[20]

TOTAAL: 100

Kopiereg voorbehou