



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

WISKUNDE N2

25 Maart 2026

Hierdie merkriglyn bestaan uit 7 bladsye.

VRAAG 1

1.1 $9x^2 + 4x - 8 = -3x^2 + 5x + 12$

$$\Rightarrow 12x^2 - x - 20 = 0 \quad \checkmark$$

$$\Rightarrow (3x - 4)(4x + 5) = 0 \quad \checkmark$$

$$\Rightarrow x = \frac{4}{3} \quad \checkmark \text{ or } x = -\frac{5}{4} \quad \checkmark$$

(4)

1.2 Verg. 1: $7b + 3m = 32,50$

Verg. 2: $5b + 2m = 22,50$

OF

Verg. 1 $\Rightarrow m = \frac{32,50 - 7b}{3} \quad \checkmark$ Verg. 3

Verg. 3 into Verg. 2 $\Rightarrow$

$$5b + 2\left(\frac{32,50 - 7b}{3}\right) = R22,50 \quad \checkmark$$

$$\Rightarrow b = R2,50 \quad \checkmark$$

$$\text{Verg. 3} \Rightarrow m = \frac{32,50 - 7(2,50)}{3} = R5 \quad \checkmark$$

$$\begin{aligned} \text{Verg. 1: } (7b + 3m = 32,50) \times 2 \\ \text{Verg. 2: } (5b + 2m = 22,50) \times 3 \\ \text{Verg. 3: } 14b + 6m = 65 \\ \text{Verg. 4: } 15b + 6m = 67,50 \quad \checkmark \\ \text{Verg. 4} - \text{Verg. 3} \Rightarrow b = R2,50 \quad \checkmark \\ \text{Verg. 3} \Rightarrow 14(2,5) + 6m = 65 \quad \checkmark \\ \Rightarrow m = \frac{65 - 35}{6} = R5 \quad \checkmark \end{aligned}$$

LET WEL: Aanvaar enige ander korrekte metode.

(4)

1.3 1.3.1 $r = \sqrt{x^2 + y^2}$

$$\Rightarrow r^2 = x^2 + y^2 \quad \checkmark$$

$$\Rightarrow r^2 - x^2 = y^2 \quad \checkmark$$

$$\Rightarrow y = \sqrt{r^2 - x^2} \quad \checkmark$$

(3)

1.3.2 $y = \sqrt{(41)^2 - (40)^2} = 9 \quad \checkmark$

(1)

1.4 $5(6q + 7) = -6(5 - 6q) \quad \checkmark$

$$\Rightarrow 30q + 35 = -30 + 36q$$

$$\Rightarrow q = \frac{65}{6} = 10,833 \quad \checkmark$$

(2)

[14]

VRAAG 2

2.1 2.1.1 $m^2 - mn = m(m - n) \quad \checkmark \checkmark$

$$m^2 + mn = m(m + n) \quad \checkmark \checkmark$$

$$m^3 - mn^2 = m(m - n)(m + n) \quad \checkmark \checkmark \checkmark$$

(7)

2.1.2 GGD = $m \quad \checkmark$ en KGV = $m(m - n)(m + n) \quad \checkmark$

(2)

$$\begin{aligned}
 2.2 \quad 2.2.1 \quad & \frac{x^2 - 5x + 6}{x^2 - 7x + 12} \div \frac{2x^2 - 8}{3x^2 - 48} \\
 &= \frac{(x-3)(x-2)\checkmark}{(x-3)(x-4)\checkmark} \times \frac{3(x-4)(x+4)\checkmark}{2(x-2)(x+2)\checkmark} \\
 &= \frac{3(x+4)}{2(x+2)} \checkmark
 \end{aligned} \tag{5}$$

$$\begin{aligned}
 2.2.2 \quad & \frac{n}{mn+m^2} + \frac{m}{n^2+mn} - \frac{1}{n} \\
 &= \frac{n}{m(n+m)} + \frac{m}{n(n+m)} - \frac{1}{n} \checkmark \\
 &= \frac{n^2+m^2-m(n+m)\checkmark}{mn(n+m)\checkmark} \\
 &= \frac{n^2-mn\checkmark}{mn(n+m)} \\
 &= \frac{n(n-m)\checkmark}{mn(n+m)} \\
 &= \frac{n-m}{m(n+m)} \checkmark
 \end{aligned} \tag{6}$$

[20]

VRAAG 3

$$\begin{aligned}
 3.1 \quad & \left(\frac{x^{m-n}}{x^{m+n}} \right)^{-\frac{1}{2}} = [x^{m-n-(m+n)}]^{-\frac{1}{2}} \checkmark \\
 &= (x^{-2n})^{-\frac{1}{2}} \checkmark \\
 &= x^n \checkmark
 \end{aligned} \tag{3}$$

$$\begin{aligned}
 3.2 \quad 3.2.1 \quad & (\log_2 x)^2 - \log_2 x = 0 \\
 & \Rightarrow \log_2 x [\log_2 x - 1] = 0 \checkmark \\
 & \Rightarrow \log_2 x = 0 \text{ or } \log_2 x = 1 \checkmark \\
 & \Rightarrow x = 1\checkmark \text{ or } x = 2\checkmark
 \end{aligned}$$

$$\begin{aligned}
 3.2.2 \quad & \frac{9^{4-2x}}{27^{3-2x}} = 3^5 \\
 & \Rightarrow \frac{3^{2(4-2x)}}{3^{3(3-2x)}} = 3^5 \checkmark \\
 & \Rightarrow 3^{2(4-2x)-3(3-2x)} = 3^5 \checkmark \\
 & \Rightarrow 8 - 4x - 9 + 6x = 5 \checkmark \\
 & \Rightarrow x = 3 \checkmark
 \end{aligned}$$

(2 × 4)

3.3

$$\begin{aligned}
 x &= \frac{\sqrt[5]{185,3}}{\sqrt[3]{812}} \\
 \Rightarrow \log x &= \log \left[\frac{\sqrt[5]{185,3}}{\sqrt[3]{812}} \right] \quad \checkmark \\
 &= \frac{1}{5} \log 185,3 - \frac{1}{3} \log 812 \quad \checkmark \\
 &= -0,5163 \quad \checkmark \\
 \Rightarrow x &= 10^{-0,5163} = 0,305 \quad \checkmark
 \end{aligned}$$

(4)
[15]

VRAAG 4

4.1

4.1.1

$$\begin{aligned}
 V &= \frac{2}{3} \pi r^3 \\
 \Rightarrow 718,378 &= \frac{2}{3} \pi r^3 \quad \checkmark \\
 \Rightarrow r^3 &= \frac{718,378 \times 3}{2\pi} \quad \checkmark \\
 \Rightarrow r &= \sqrt[3]{\frac{718,378 \times 3}{2\pi}} = 7 \text{ cm} \quad \checkmark
 \end{aligned}$$

(3)

4.1.2

$$\begin{aligned}
 SA &= 2\pi r^2 \quad \checkmark \\
 &= 2\pi(7)^2 \quad \checkmark \\
 &= 98\pi \text{ cm}^2 \text{ or } 307,876 \text{ cm}^2 \quad \checkmark
 \end{aligned}$$

(3)

4.1.3

$$\begin{aligned}
 \text{Volume} &= \frac{1}{2} \times 718,378 = 359,189 \text{ cm}^3 \quad \checkmark \\
 SA &= \frac{1}{2} \times 98\pi = 49\pi = 153,938 \text{ cm}^2 \quad \checkmark
 \end{aligned}$$

(2)

4.2

$$\begin{aligned}
 \text{Opp} &= \left[\frac{\text{Eerste ordinaat} + \text{Laaste ordinaat}}{2} + \text{som v alle ander ordinate} \right] \times \text{afstand} \\
 \Rightarrow 248 \checkmark &= \left[\frac{x + 2 + x}{2} + \frac{17}{2} + 9 + x + 4 + \frac{23}{2} + 12 \right] \times 4 \quad \checkmark \\
 \Rightarrow 62 &= 45 + x + 1 \quad \checkmark \\
 \Rightarrow 16 &= x \\
 \Rightarrow x &= 16 \text{ cm} \quad \checkmark
 \end{aligned}$$

(4)
[12]

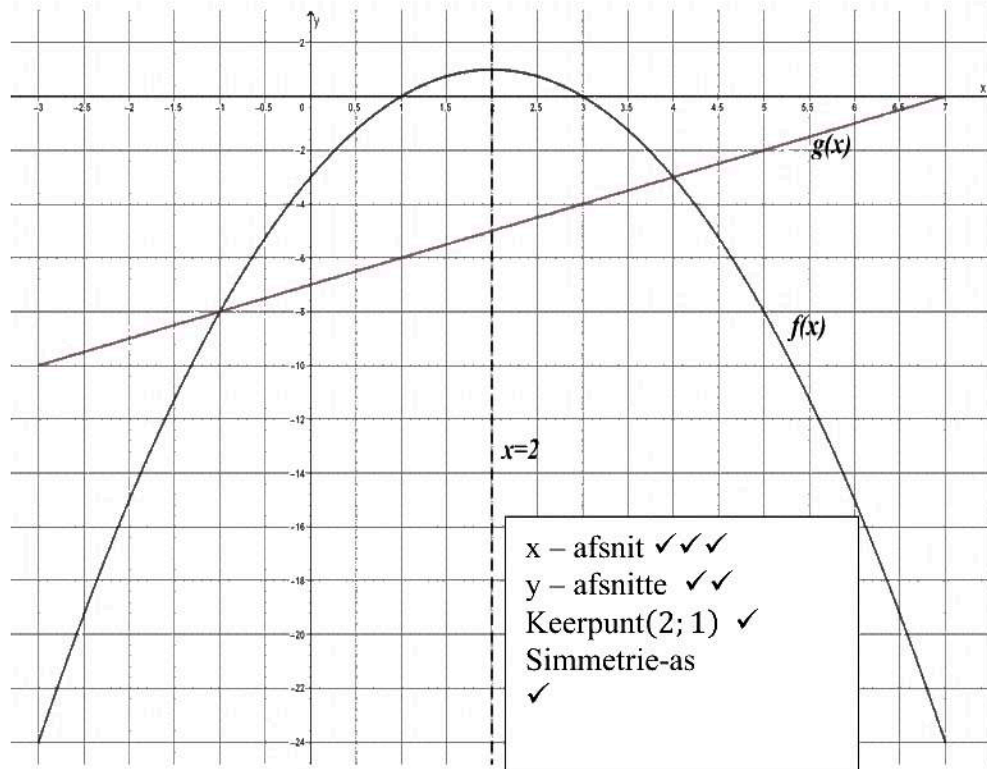
VRAAG 5

5.1 5.1.1

x	-3	-2	-1	0	1	2	3	4	5	6	7
$f(x)$	-24	-15	-8	-3	0	1	0	-3	-8	-15	-24
$g(x)$	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0

(2)

5.1.2



(7)

5.1.3 $(-1; -8)$ ✓ en $(4; -3)$ ✓

(2)

5.1.4 $x = -\frac{-4}{2(-1)} = 2$ ✓

(1)

5.1.5 $(2; 1)$ ✓

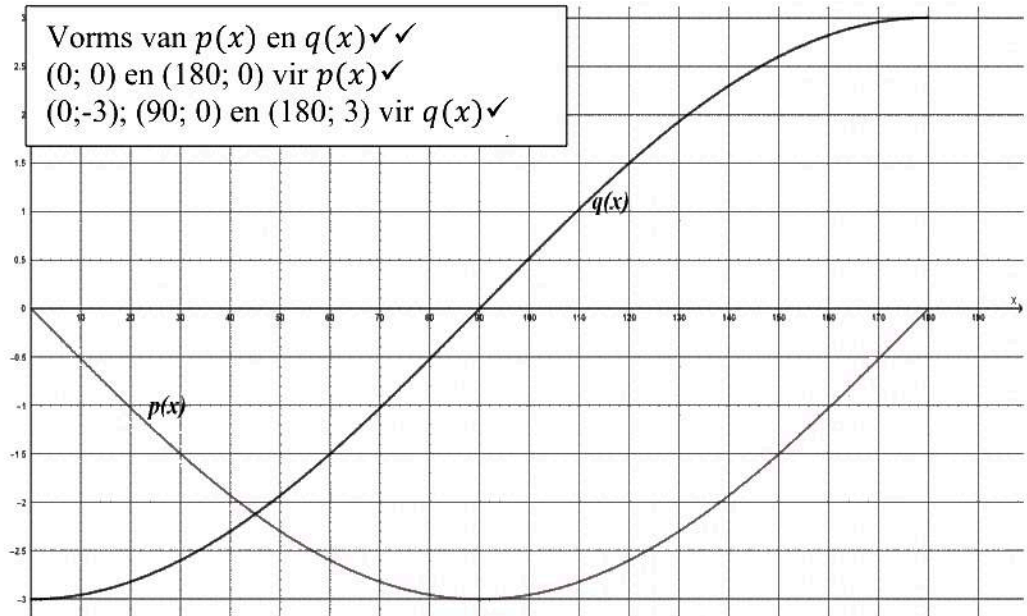
(1)

5.2 5.2.1

x	0	30	60	90	120	150	180
$p(x)$	0	-1,5	-2,6	-3	-2,6	-1,5	0
$q(x)$	-3	-2,6	-1,5	0	1,5	2,6	3

(1)

5.2.2



LET WEL: Aanvaar akkuraatheid van ± 1 vir x -waardes en ± 0.1 vir y -waardes (4)

5.2.3 $x = 45^\circ$ ✓ en $y = -2,1$ (2)
[20]

VRAAG 6

6.1 $37,8^\circ = 37^\circ + 0,8^\circ \times 60$ ✓
 $= 37^\circ 48'$ ✓ (2)

6.2 $D = \frac{x^2}{4h} + h$
 $= \frac{(12)^2}{4(18)} + 18$ ✓
 $= 20 \text{ cm}$ ✓
 $\Rightarrow r = \frac{20}{2} \text{ cm}$ ✓
 $= 10 \text{ cm}$ ✓ (4)

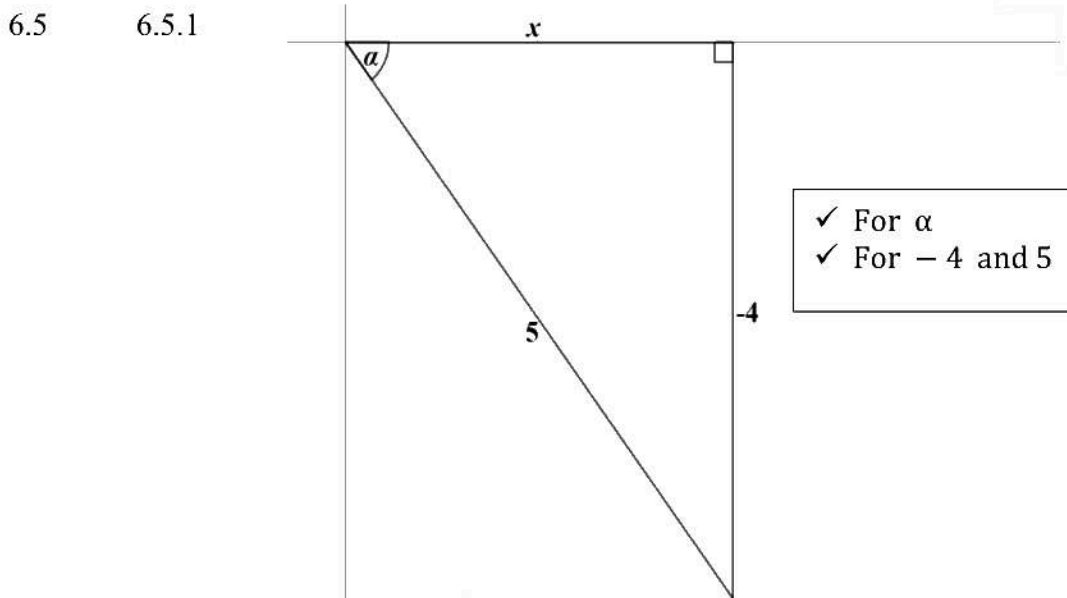
6.3 $\theta = 25^\circ \times \frac{\pi}{180^\circ} = 0,436 \text{ rads} = \frac{5\pi}{36}$ ✓
 $r = \frac{21 \text{ cm}}{2} = 10,5 \text{ cm}$ ✓
 $\therefore \text{Opp} = \frac{1}{2} \times (10,5)^2 \times 0,436$ of $\text{Opp} = \frac{1}{2} \times \left(\frac{21}{2}\right)^2 \times \frac{5\pi}{36}$ ✓
 $= 24,035 \text{ cm}^2$ of $\frac{48069}{2000} \text{ cm}^2$ of $24,053 \text{ cm}^2$ ✓ (4)

6.4 6.4.1 $\omega = 2\pi N$ waar
 $N = 32 \text{ revs. per minuut} = \frac{32}{60} \text{ revs. per sekonde} \checkmark$
 $\therefore \omega = 2\pi \times \frac{32}{60} = \frac{16\pi}{15} = 3,351 \text{ rads per sekonde} \checkmark$

6.4.2 $V = \pi DN$
 $= \pi(2 \times 15) \times \frac{32}{60} \checkmark$
 $= 16\pi \text{cm}^2 \text{ of } 50,265 \text{cm}^2 \checkmark$

$V = \omega R$
 $= \frac{16\pi}{15} \times 15 \checkmark$
 $= 16\pi \text{cm}^2 \text{ of } 50,265 \text{cm}^2 \checkmark$

(2 × 2) (4)



(2)

6.5.2 $\operatorname{cosec} \alpha = -\frac{5}{4}$
 $\Rightarrow \sin \alpha = -\frac{4}{5} = \frac{y}{r} \checkmark$
 $\Rightarrow x = \sqrt{5^2 - (-4)^2} = 3 \text{ aangesien } 270^\circ \leq \alpha \leq 360^\circ \checkmark$
 $\therefore \tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{-4}{3} = -\frac{4}{3}$
 $= -\frac{8}{15} \checkmark$

(3)

[19]

TOTAAL: 100