



Province of the
EASTERN CAPE
EDUCATION

**NASIONALE
SENIOR SERTIFIKAAT**

GRAAD 11

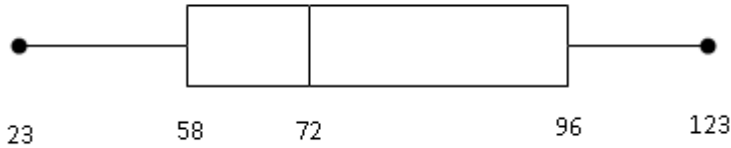
NOVEMBER 2010

**WISKUNDE – VRAESTEL 2
MEMORANDUM**

PUNTE: 150

Hierdie memorandum bestaan uit 14 bladsye.

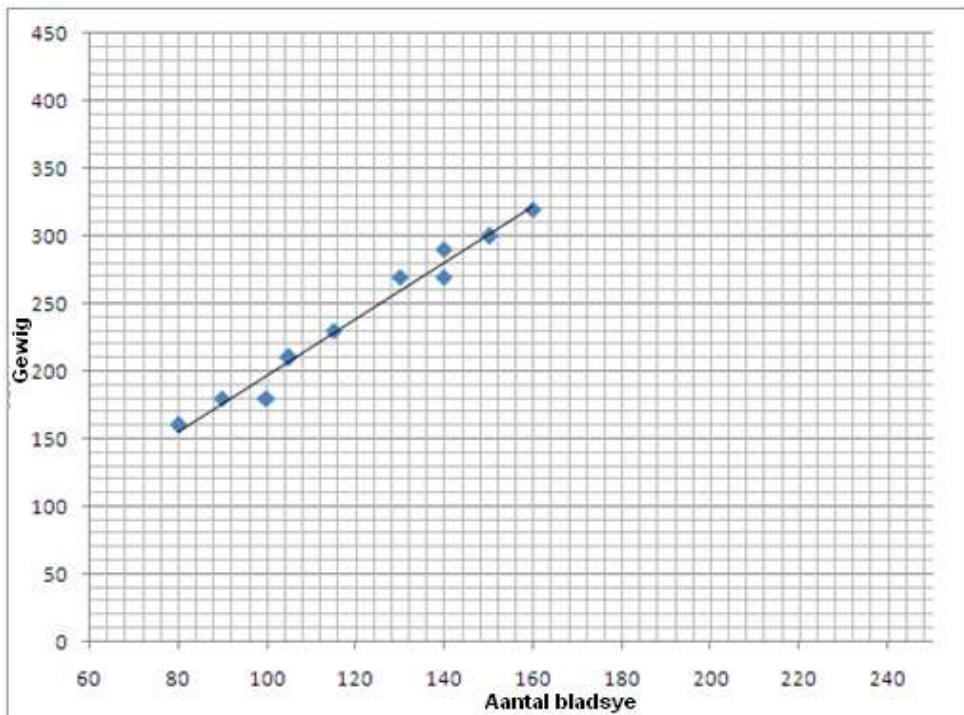
VRAAG 1

1.1.1	<p>Mediaan = 72 ; $\frac{Q_3 - 58}{2} = 19 \therefore Q_3 = 96$</p> 	<p>mediaan = 72</p> <p>✓ $\frac{Q_3 - 58}{2} = 19$</p> <p>✓ $Q_3 = 96$</p> <p>✓ boks met snor</p> <p>✓ min en maks waardes</p> <p>✓ kwartiele (6)</p>
1.1.2	Data is positief skeef/ skeef na regs.	✓ antwoord. (1)
1.2	<p>Standaard afwyking vir Span A = 10,99</p> <p>Span B = 19,94</p> <p>\therefore die tellings vir span B is meer verspreid as die van span A.</p>	<p>✓✓ st. afwyk. vir A</p> <p>✓✓ st. afwyk. vir B</p> <p>✓ gevolgtrekking (5)</p>

[12]

VRAAG 2

2.1.1



✓ asse benoem

Al 10 punte korrek
(2 punte)Enige 5 punte korrek
(1 punt)

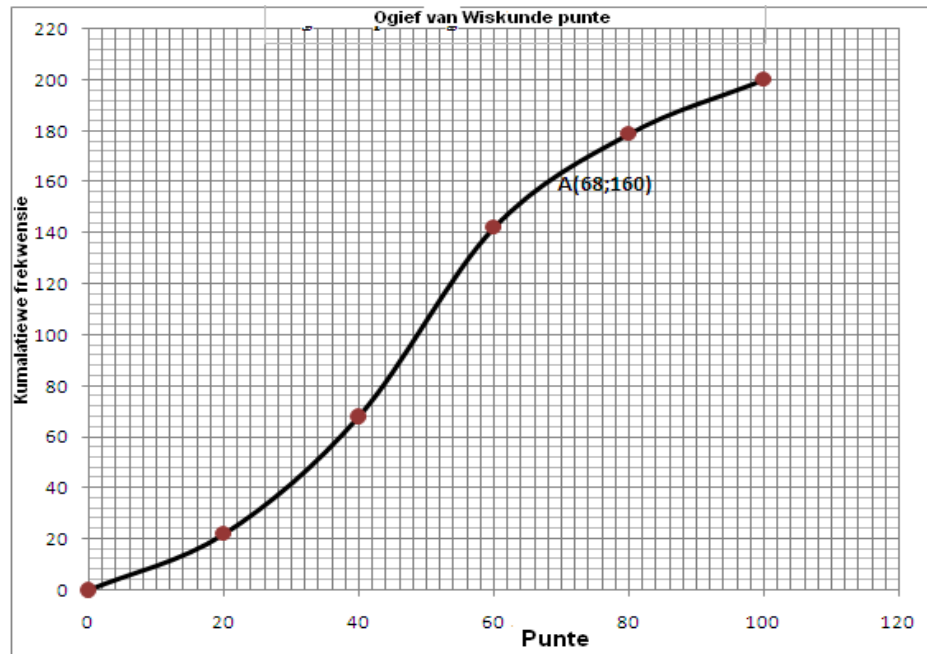
0 tot 4 punte (0 punt)

(3)

2.1.2	Positiewe verwantskap			✓ antwoord	(1)
2.1.3	Sien grafiek in 2.1.1			✓✓ lyn van pas	(2)
2.1.4	2.1.4.1	140		✓ antwoord	(1)
	2.1.4.2	400		✓ antwoord	(1)
2.2.1	Punte	Frekwensie	Kum. Frekwensie	Al 5 frekwensies korrek (2 punte)	
	$0 \leq x < 20$	22	22		
	$20 \leq x < 40$	46	68		
	$40 \leq x < 60$	74	142		
	$60 \leq x < 80$	37	179	2 tot 4 frekwensies korrek(1 punt)	
	$80 \leq x < 100$	21	200		

(2)

2.2.2



✓ Byskrifte op die asse

Plot al 6 punte
korrek (2 punte)Plot 3 tot 5 punte
korrek (1 punt)Plot 0 tot 2 punte
(0 punte)

✓ kromme

(4)

2.2.3

Sien grafiek hierbo A(68;160)

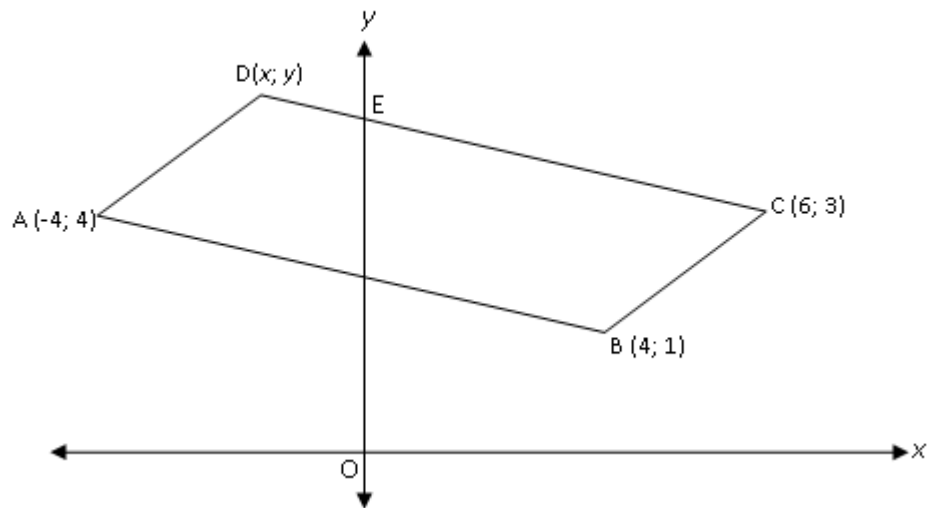
✓ A op grafiek

✓ 68 punte

(2)

[16]

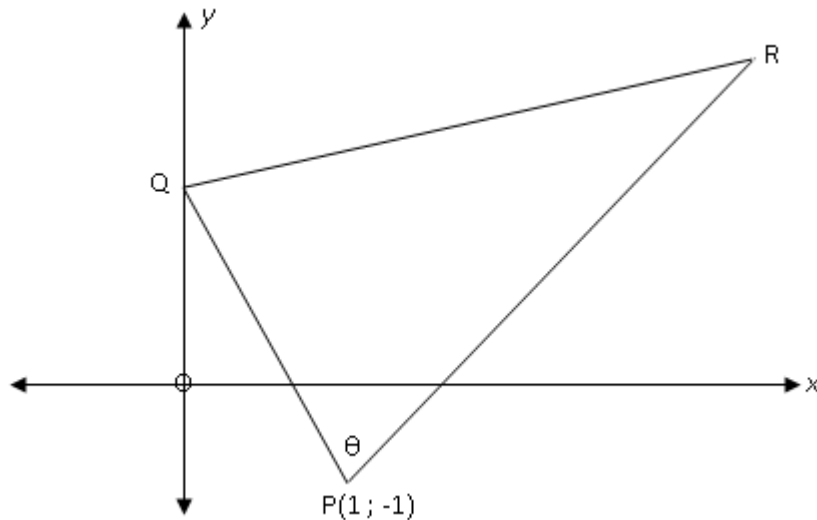
VRAAG 3



3.1	<p>Gradiënt van AB: $\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 1}{-4 - 4} = -\frac{3}{8}$</p> <p>$\therefore DC_m = -\frac{3}{8} \quad \therefore y = -\frac{3}{8}x + c$</p> <p>$\therefore 3 = -\frac{3}{8}(6) + c \quad c = \frac{42}{8}$</p> <p>$\therefore$ Vergelyking van DC: $y = -\frac{3}{8}x + \frac{42}{8}$</p>	<p>✓ $AB_m = -\frac{3}{8}$</p> <p>✓ $DC_m = -\frac{3}{8}$</p> <p>✓ $y = -\frac{3}{8}x + c$</p> <p>✓ subst.(6 ; 3)</p> <p>✓ waarde van c</p> <p>(5)</p>
3.2	D(-2 ; 6)	<p>✓ x-koördinate</p> <p>✓ y-koördinate</p> <p>(2)</p>
3.3	<p>$E\left(0; \frac{42}{8}\right)$</p> <p>Middelpunt van DC: $\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right) = \left(\frac{-2 + 6}{2}; \frac{6 + 3}{2}\right)$</p> <p>$= \left(2; \frac{9}{2}\right)$</p> <p>$\therefore E\left(0; \frac{42}{8}\right)$ is nie die middelpunt van DC nie</p>	<p>✓ $E\left(0; \frac{42}{8}\right)$</p> <p>✓ $\left(\frac{-2 + 6}{2}; \frac{6 + 3}{2}\right)$</p> <p>✓ $\left(2; \frac{9}{2}\right)$</p> <p>✓ gevolgtrekking</p> <p>(4)</p>

3.4	$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(4 + 4)^2 + (1 - 4)^2}$ $AB = \sqrt{64 + 9} \quad \therefore AB = \sqrt{73}$	✓ afstand. formule ✓ Substitusie. ✓ $\sqrt{73}$
3.5	$AD_m = \frac{6 - 4}{-2 + 4} = 1 \quad \therefore \tan \theta = 1$ $\therefore \text{Inklinasie } \theta = 45^\circ$	✓ $AD_m = 1$ ✓ $\tan \theta = 1$ ✓ $\theta = 45^\circ$

[17]

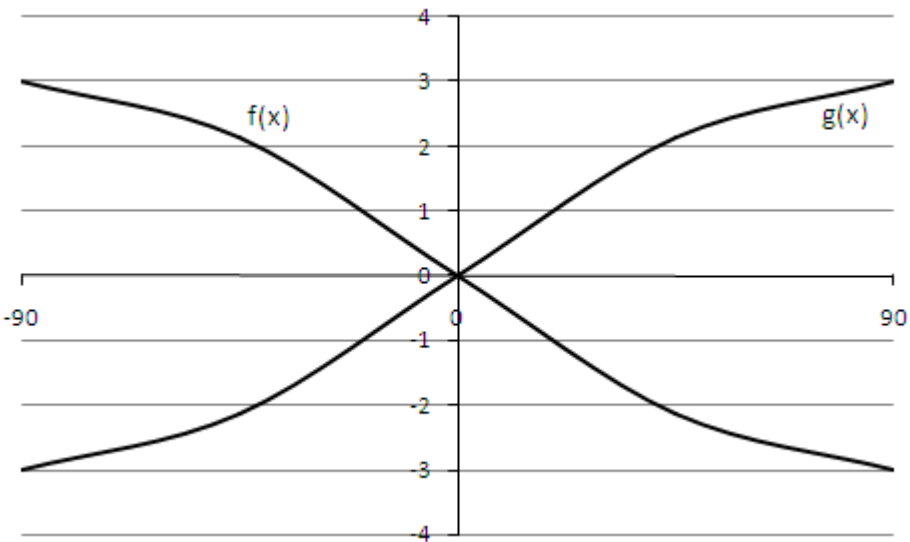
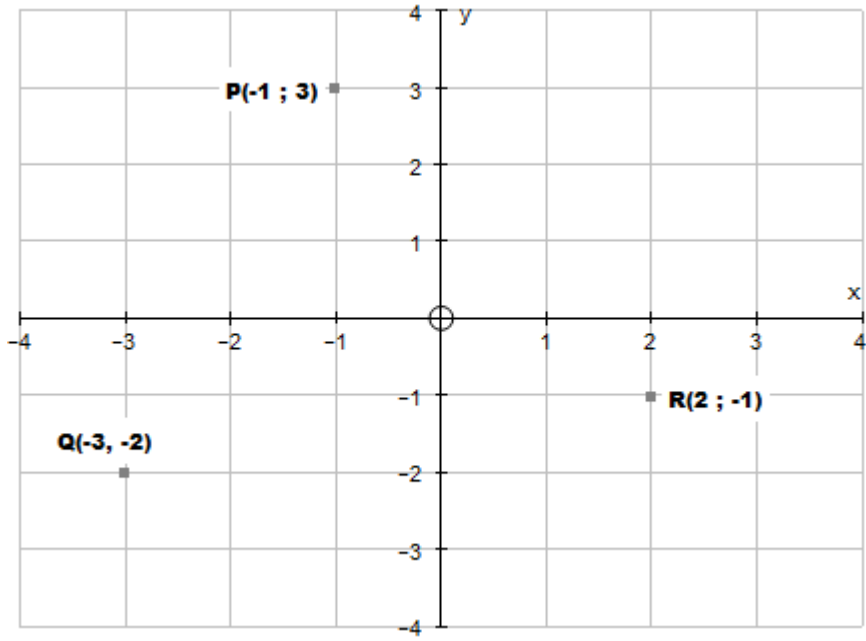
VRAAG 4

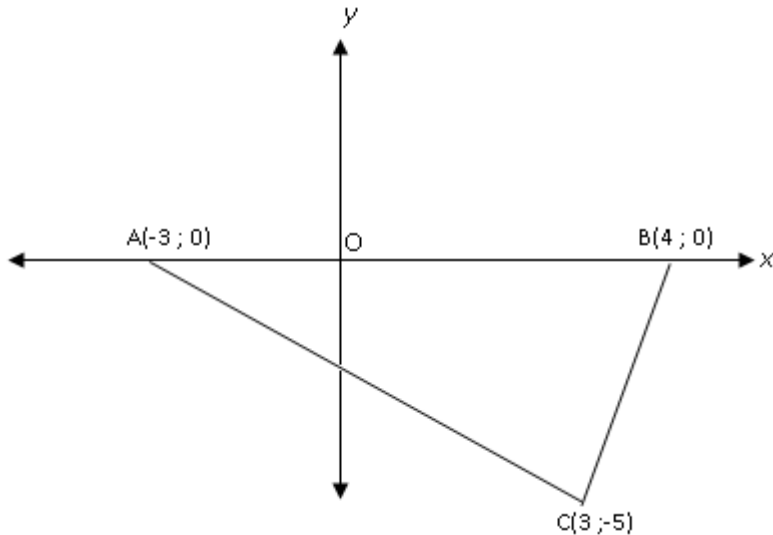
4.1	$QR: x - 3y = -6 \quad \therefore y = \frac{1}{3}x + 2$ $\therefore y \text{ koördinate of } Q = 2$	✓ Vergelyking in st. vorm ✓ y-koördinate = 2
4.2	$QR_m = \frac{1}{3} \quad PQ_m = \frac{2 - (-1)}{0 - 1} = -3$ $\therefore QR_m \cdot PQ_m = \frac{1}{3}(-3) = -1$ $\therefore \text{die produk van die gradiënte} = -1$ $\therefore PQ \perp QR$	✓ $QR_m = \frac{1}{3}$ ✓ $PQ_m = \frac{2 - (-1)}{0 - 1} = -3$ ✓ $QR_m \cdot PQ_m = -1$

(3)

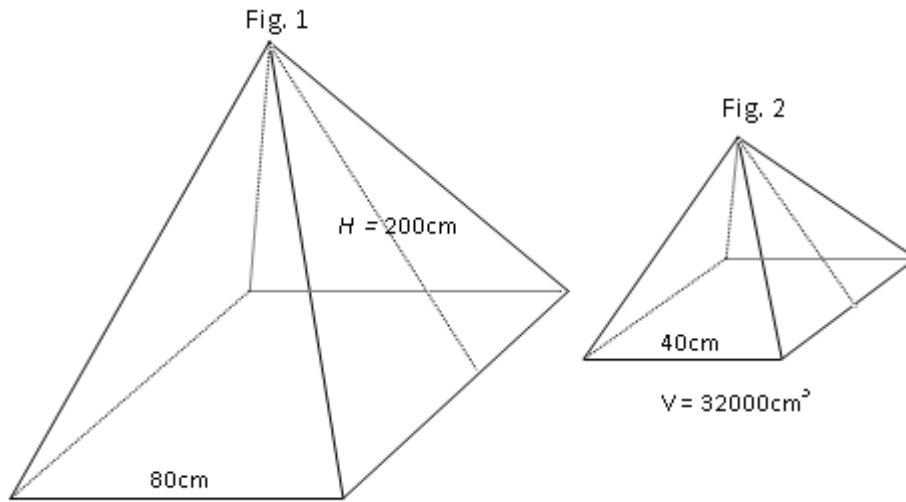
4.3	$PR_m = -1$	✓ antwoord (1)
4.4	$\tan \theta = -3 \quad \therefore \theta = 180^\circ - 71,57^\circ = 108,43^\circ$ $\therefore 108,43^\circ = \theta + \tan^{-1}(1)$ $\therefore 108,43^\circ = \theta + 45^\circ$ $\therefore \theta = 63,43^\circ$	✓ $\tan \theta = -3$ ✓ $108,43^\circ$ ✓ $108,43^\circ = \theta + \tan^{-1}(1)$ ✓ 45° ✓ $\theta = 63,43^\circ$ (5)
4.5	$R(x; 4) \Rightarrow x - 4 - 2 = 0 \quad \therefore x = 6$ $\therefore S\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ $= S\left(\frac{0 + 6}{2}, \frac{2 + 4}{2}\right) = S(3; 3)$ $PS_m = \frac{3 - (-1)}{3 - 1} = 2$ $\therefore y = 2x + c \quad \therefore -1 = 2(1) + c \quad \therefore c = -3$ $\therefore y = 2x - 3$	✓ $x = 6$ ✓ $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ ✓ $S(3; 3)$ ✓ $PS_m = 2$ ✓ $y = 2x + c$ ✓ $-1 = 2(1) + c$ ✓ $c = -3$ (7)

VRAAG 5

5.1	
5.1.1	<div>Maksimum by $(90^\circ ; 3)$</div> <div>✓✓ elke koördinaat (2)</div>
5.1.2	<div>Draaipunte by $(-90^\circ ; -3)$; $(90^\circ ; 3)$</div> <div>✓✓✓✓ koördinate by elke punte (4)</div>
5.2	
5.2.1	<div>$R'(-1 ; 1)$; $P'(-4 ; 5)$ en $Q'(-6 ; 0)$</div> <div>✓✓✓ koördinate van elke punt (3)</div>

5.2.2	$Q'(2;-3)$	✓✓ die twee koördinate	(2)
5.2.3	$P''(-3; 1)$	✓✓ die twee koördinate	(2)
5.2.4	$(x; y) \longrightarrow (-x; y)$	✓✓ antwoord	(2)
5.2.5	$R''(1; 1)$	✓✓ antwoord	(2)
5.3			
5.3.1	$\text{Area van } \triangle ABC: = \frac{1}{2}bh \Rightarrow \text{Area} = \frac{1}{2}AB \cdot h = \frac{1}{2}7(5)$ $= 17,5 \text{ vk. eenhede}$	✓ $\frac{1}{2}7(5)$ ✓ antwoord	(2)
5.3.2	Faktor van 4	✓✓ antwoord	(2)
5.3.3	$\triangle ABC : \triangle A'B'C' = 1 : 2$	✓✓ antwoord	(2)
5.3.4	$A'B' = 14$ eenhede	✓✓ antwoord	(2)

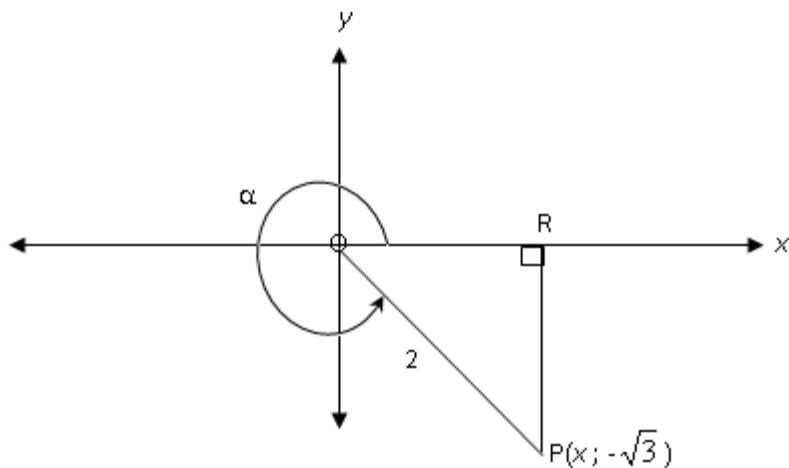
VRAAG 6



6.1	<p>Loodr. hoogte van Fig. 1: $h^2 = H^2 - 40^2$</p> <p>$h^2 = 200^2 - 40^2$</p> <p>$h^2 = 40000 - 1600$ $h^2 = 38400$</p> <p>$\therefore h \approx 195,96 \text{ cm}$</p> <p>$\therefore$ Vol. van piramide: $V = \frac{1}{3} \text{ area van basis. Hoogte}$</p> <p>$V = \frac{1}{3}(80)(80)(195,96) \text{ cm}^3$</p> <p>$V = 418048 \text{ cm}^3$</p>	<p>✓ $h^2 = 200^2 - 40^2$</p> <p>✓ $h \approx 195,96 \text{ cm}$</p> <p>✓ metode/ formule</p> <p>✓ substitusie</p> <p>✓ antwoord (5)</p>
6.2	<p>$V = \frac{1}{3} \text{ area of basis. Hoogte} \therefore 32\,000 = \frac{1}{3}(40)(40)h \text{ cm}^3$</p> <p>$\therefore h = 60 \text{ cm}$</p> <p>Skuinshoogte: $H^2 = 60^2 + 20^2 \therefore H = 63,25 \text{ cm}$</p> <p>$\therefore$ area van 1 vlak: $A = \frac{1}{2}b.h = \frac{1}{2}40(63,25) = 1265 \text{ cm}^2$</p> <p>$\therefore$ buiteoppervlakte $= 1265 \times 4 = 5060 \text{ cm}^2$</p>	<p>✓ metode en subst. vir V</p> <p>✓ $h = 60 \text{ cm}$</p> <p>✓ $H = 63,25 \text{ cm}$</p> <p>✓ Area formule en subst.</p> <p>✓ area van 1 sy</p> <p>✓ area vir 4 sye (6)</p>

VRAAG 7

7.1



7.1.1	$x = 1$	✓ antwoord (1)
7.1.2	$\sin(360^\circ - \alpha) = -\sin\alpha = -(-\frac{\sqrt{3}}{2}) = \frac{\sqrt{3}}{2}$	✓ $-\sin\alpha$ ✓ antwoord (2)
7.2	$\cos 160^\circ = -\cos 20^\circ = \frac{1}{p}$ $\sin 250^\circ = -\sin 70^\circ = -\cos 20^\circ = \frac{1}{p}$	✓ $-\cos 20^\circ$ ✓ $-\sin 70^\circ$ ✓ $-\cos 20^\circ$ ✓ $\frac{1}{p}$ (4)

[7]

VRAAG 8

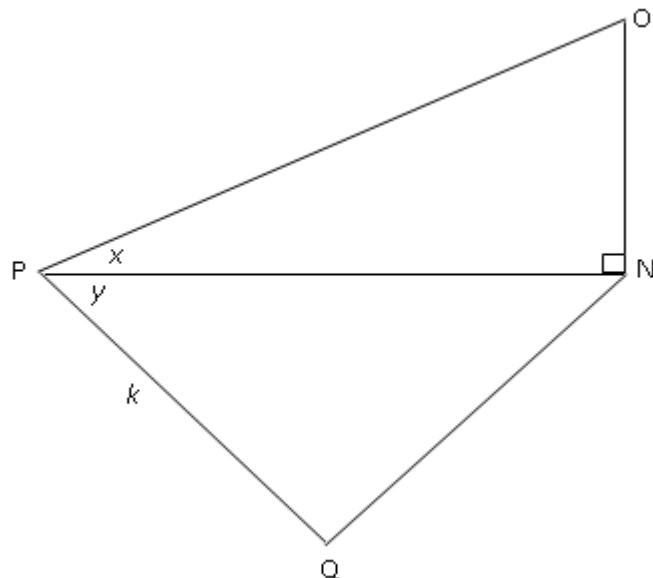
8.1	$\frac{1}{\cos^2 x} + \frac{1}{\sin^2 x} = \frac{\sin^2 x + \cos^2 x}{\cos^2 x \cdot \sin^2 x}$ $= \frac{(\sin^2 x + \cos^2 x) = 1}{\cos^2 x \cdot \sin^2 x}$ $= \frac{1}{\cos^2 x \cdot \sin^2 x}$	✓ noemer ✓ vereenvoudiging van breuk ✓ identiteit (3)
8.2	$\sqrt{\frac{\sin(-390^\circ)}{\cos 240^\circ} + \tan(180^\circ + \theta) \cdot \cos(180^\circ + \theta) \cdot \cos(90^\circ - \theta)}$ $= \sqrt{\frac{-\sin 30^\circ}{-\cos 60^\circ} + \tan \theta \cdot -\cos \theta \cdot \sin \theta}$ $= \sqrt{\frac{-\sin 30^\circ}{-\sin 30^\circ} + \tan \theta \cdot -\cos \theta \cdot \sin \theta}$ $= \sqrt{1 - \frac{\sin \theta}{\cos \theta} \cdot -\cos \theta \cdot \sin \theta}$ $= \sqrt{1 - \sin^2 \theta}$ $= \sqrt{\cos^2 \theta}$ $= \cos \theta$	✓ $-\sin 30^\circ$ ✓ $-\cos 60^\circ$ ✓ $\tan \theta$ ✓ $-\cos \theta$ ✓ $\sin \theta$ ✓ $\sin 30^\circ$ ✓ $\frac{\sin \theta}{\cos \theta}$ ✓ vereenvoudiging ✓ $\cos \theta$ (9)

[12]

VRAAG 9

	✓✓ beide x -afsnitte ✓✓ beide y -afsnitte ✓✓ beide draaipunte (6)
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VRAAG 11



11.1	$\text{Area van } \triangle NPQ = \frac{1}{2} \text{PN} \cdot \text{PQ} \sin P$ $\therefore h = \frac{1}{2} \text{PN} \cdot k \sin y \quad \therefore \text{PN} = \frac{2h}{k \sin y}$	✓ subst. in sine vorm. ✓ vereenvoudiging (2)
11.2	$\frac{\text{ON}}{\text{PN}} = \tan x \quad \therefore \text{ON} = \text{PN} \cdot \tan x$ $\text{ON} = \frac{2h \tan x}{k \sin y}$	✓ tan verhouding ✓ vereenvoudiging ✓ $\frac{2h \tan x}{k \sin y}$ (3)
11.3	$\text{PN} = \frac{\text{ON}}{\tan x}$ $\therefore \text{Area} = \frac{1}{2} 186(106,02) \sin 31,7^\circ$ $\text{PN} = \frac{30}{\tan 15,85^\circ} = 5181,08 \text{ m}^2$ $\text{PN} = 106,02 \text{ m}$	✓ $\text{PN} = \frac{\text{ON}}{\tan x}$ ✓ $\text{PN} = 106,02$ ✓ Subst. in area vorm. ✓ antwoord (4)

[9]

TOTAAL: 150