

NAME OF LEARNER: NAAM VAN LEERDER:	Selw
CLASS: KLAS:	SUT

**NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SERTIFIKAAT**

MATHEMATICS P2/WISKUNDE V2

GRADE/GRAAD 10

NOVEMBER 2015

**SPECIAL ANSWER BOOK
SPESIALE ANTWOORDEBOEK**

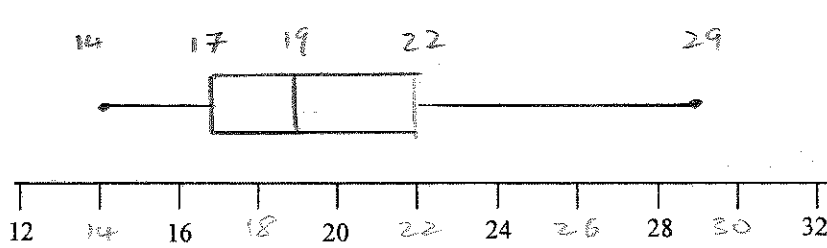
QUESTION VRAAG	MARK PUNT			INITIAL PARAAF	MODERATION MODERERING			INITIAL PARAAF
1								
2								
3								
4								
5								
6								
7								
8								
9								
TOTAL TOTAAL (100)								

**This answer book consists of 16 pages.
Hierdie antwoordeboek bestaan uit 16 bladsye.**



QUESTION/VRAAG 1

				Q_1					M
14	15	16	16	17	17	18	18	19	19
19	20	21	21	22	23	24	24	29	
				Q_3					

	Solution/Oplossing	Marks/Punte
1.1	$M = T_{\frac{1}{2}(1+19)} = T_{10}$ $= 19$ ✓ (T_1, \dots, T_{19})	(1)
1.2	$Q_1 = 17$ ✓ $Q_3 = 22$ ✓	(2)
1.3	$min = 14$ $Q_1 = 17$ $M = 19$ $Q_3 = 22$ $max = 29$ ✓  ✓ b+w ✓ scale	(2)
1.4.1	$min = 15$ $Q_1 = 19$ $M = 23$ $Q_3 = 26$ $max = 30$ $IQR = Q_3 - Q_1 = 26 - 19 = 7$ ✓ ✓ answer only 2/2	(2)
1.4.2	$Q_1 = 19$ 25% > 19 ∴ 75% ✓	(1)
1.5	$Girls < 23s = \frac{15}{19} \times 100 = 78,94... \%$ ✓ $Boys < 23s = M = 50\%$ ∴ Girls ✓ answer only 0/2	(2)

[10]



QUESTION/VRAAG 2

NUMBER OF HOURS (<i>h</i>)/ GETAL UUR (<i>h</i>)	FREQUENCY/ FREKWENSIE
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

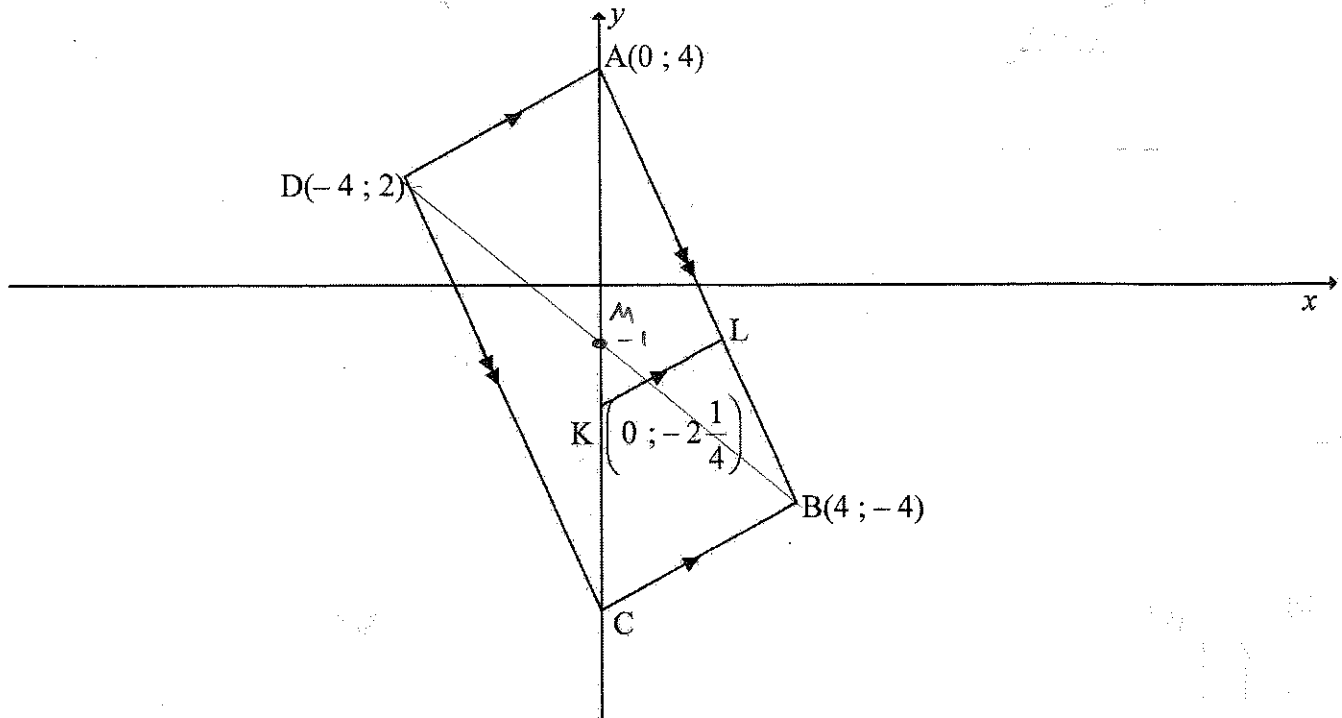
10
25
55
90
115
120

	Solution/Oplissing	Marks Punte
2.1	<p>Modal class = <u>$6 < h \leq 8$</u> ✓</p>	(1)
2.2	<p>\bar{x}</p> $= \frac{(1 \times 10) + (3 \times 15) + (5 \times 30) + (7 \times 35) + (9 \times 25) + (11 \times 5)}{10 + 15 + 30 + 35 + 25 + 5}$ $= \frac{730}{120}$ $= 6,08 \text{ h}$ <p>answer only 3/3 don't penalise units</p>	(3)
		[4]

1
3



QUESTION/VRAAG 3



	Solution/Oplissing	Marks Punte
3.1	DB $D(-4; 2) B(4; -4)$ $= \sqrt{(-4-2)^2 + (4-(-4))^2}$ ✓✓ $= \sqrt{100}$ $= 10$ ✓ \Rightarrow wrong formula 0/3	(3)
3.2	$x_m = \frac{-4+4}{2}$ ✓ $y_m = \frac{2+(-4)}{2}$ ✓ $D(-4; 2) B(4; -4)$ $= 0$ $= -1$ $\therefore M(0; -1)$ ✓✓ \Rightarrow wrong formula 0/3	(3)

3
3

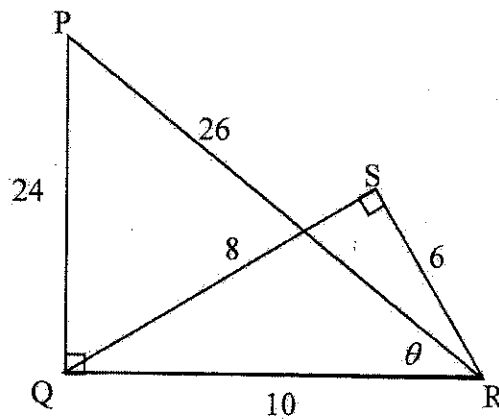


	Solution/Oplissing	Marks Punte
3.3	$m_{AD} = \frac{2-4}{-4-0} = \frac{1}{2}$ <p style="text-align: right;">$A(0;4) \quad D(-4;2)$</p> <p>must simplify</p> <p>wrong formula 0/3</p>	3 (3)
3.4	$m_{AB} = \frac{-4-4}{4-0} = -2$ <p style="text-align: right;">$A(0;4) \quad B(4;-4)$</p> <p>product of grads</p> $\therefore m_{AD} \cdot m_{AB} = \left(\frac{1}{2}\right) \cdot (-2) = -1$ <p>$\therefore AD \perp AB$</p>	3 (3)
3.5	<p>ABCD is a rectangle because it is a</p> <ul style="list-style-type: none"> • llgm with • 1 interior $\hat{} = 90^\circ$ 	1 (1)
3.6	$m_{KL} = m_{AD} \quad \text{given} \quad K(0; -\frac{9}{4}) \quad L$ <p style="text-align: center;">(3.3.)</p> <p>clearly $c = -\frac{9}{4}$</p> $\therefore y = \frac{1}{2}x - \frac{9}{4}$ <p>must be an eqn</p>	2 (2)
3.7	<p>$DB = 10$ (3.1.) (OR) $A \begin{matrix} x: 4 \leftarrow \\ y: 2 \downarrow \end{matrix} \rightarrow D$</p> <p>$\checkmark$ AC diags rect =</p> <p>$y_A = 4 \xrightarrow{-10} y_C = -6$</p> <p>$\therefore C(0; -6)$</p> <p>both prs opp sides llgm \therefore equal gradients \checkmark</p>	3 (3) [18]

(OR) ... pg. 9



QUESTION/VRAAG 4



- common/improper fractions need not be simplified
- answers may not be left as multi-layered fractions

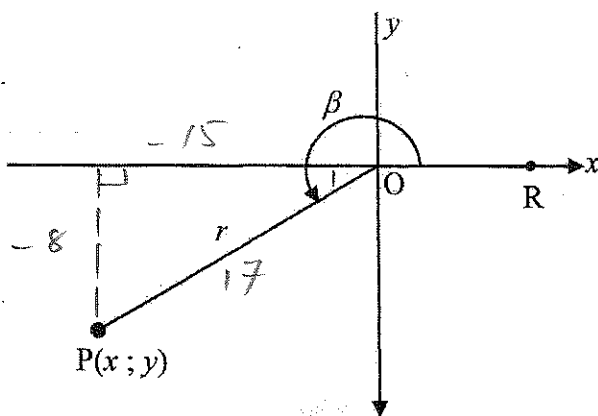
	Solution/Oplissing	Marks/Punte
4.1.1	$\tan \hat{P} = \frac{10}{24}$ $= \frac{5}{12}$	(1)
4.1.2	$\sin \hat{SQR} = \frac{6}{10}$ $= \frac{3}{5}$	(1)
4.1.3	$\cos \theta = \frac{10}{26}$ $= \frac{5}{13}$	(1)
4.1.4	$\frac{1}{\cos \hat{SQR}} = \frac{1}{\frac{3}{5}} = 1 \div \frac{3}{5} = 1 \times \frac{5}{3}$ $= \frac{5}{3}$	(1)
4.2	$\sin \hat{QRS} = \frac{8}{10} = \frac{4}{5}$ $\tan \theta = \frac{24}{10} = \frac{12}{5}$ $\frac{\sin \hat{QRS}}{\tan \theta} = \frac{\frac{4}{5}}{\frac{12}{5}} = \frac{4}{5} \div \frac{12}{5} = \frac{4}{5} \times \frac{5}{12} = \frac{4}{12} = \frac{1}{3}$	(3)
	[7]	

3



QUESTION/VRAAG 5

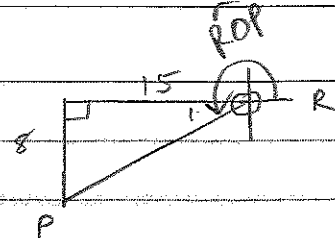
5.1



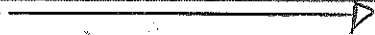
	Solution/Oplissing	Marks/Punte
5.1.1	$17 \cos \beta + 15 = 0 \quad \therefore \cos \beta = -\frac{15}{17} = -\frac{15}{17} \frac{x}{r}$ $\therefore x = -15 \checkmark \quad r = 17 \checkmark$ $x^2 + y^2 = r^2$ Pythag $(-15)^2 + y^2 = (17)^2 \checkmark$ $225 + y^2 = 289$ $y^2 = 64$ $y = \pm \sqrt{64}$ $\therefore y = -8 \checkmark$	(4)
5.1.2(a)	$\sin \beta = \frac{-8}{17} \checkmark$	(1)
5.1.2(b)	$\cos^2 30^\circ = (\cos 30^\circ)^2$ $= \left(\frac{\sqrt{3}}{2}\right)^2$ $= \frac{3}{4} \checkmark$	(3)
	$\tan \beta = \frac{-8}{-15} = \frac{8}{15} \checkmark$	
	$\therefore \cos^2 30^\circ \cdot \tan \beta = \frac{3}{4} \cdot \frac{8}{15} = \frac{2}{5} \checkmark$	

4
1
3



	Solution/Oplissing	Marks Punte
5.1.3	$\tan \hat{O}_1 = \frac{8}{15}$ $\therefore \hat{O}_1 = \tan^{-1}\left(\frac{8}{15}\right)$ $= 28,07...^\circ \quad \checkmark$ $\therefore \hat{R\hat{O}P} = 180^\circ + 28,07...^\circ$ $= \underline{208,07^\circ} \quad \checkmark$ 	2 (2)
5.2.1	$\tan x = 2,22$ $x = \tan^{-1}(2,22)$ $= \underline{65,75^\circ} \quad \checkmark \checkmark$ <p style="text-align: right;">rounding - 1</p>	2 (2)
5.2.2	$\cos(x+10^\circ) = 0,179 \quad \text{let } A = x+10^\circ$ $\cos A = 0,179$ $A = \cos^{-1}(0,179)$ $= 79,68...^\circ \quad \checkmark$ $x+10^\circ = 79,68...^\circ \quad \checkmark$ $\therefore x = \underline{69,69^\circ} \quad \checkmark$	3 (3)
5.2.3	$\frac{\sin x}{0,2} - 2 = 1,24$ $\frac{\sin x}{0,2} = 3,24 \quad \checkmark$ $\sin x = \frac{81}{125} \quad \checkmark$ $x = \sin^{-1}\left(\frac{81}{125}\right)$ $= \underline{40,39^\circ} \quad \checkmark$ <p style="text-align: right;">0,648</p>	3 (3)
		[18]



	Additional space/Bykomende ruimte	Marks Punte
	<p>3.7. $m_{BC} = m_{AD}$ ✓ opp sides gm $= \frac{1}{2}$ grad's =</p> <p>$\therefore y = \frac{1}{2}x + c$ sub B(4; -4) $-4 = \frac{1}{2}(4) + c$ ✓ $-6 = c$ $\therefore y = \frac{1}{2}x - 6$</p> <p>$\therefore C(0; -6)$ ✓ y int </p>	



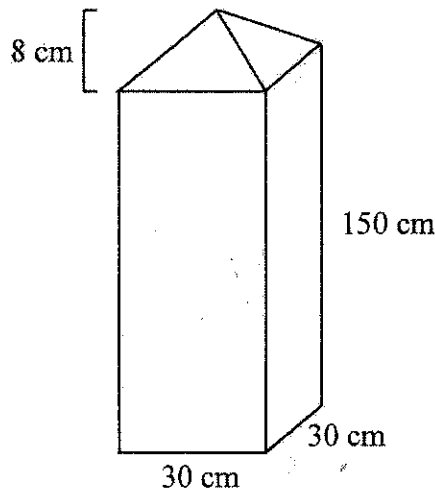
QUESTION/VRAAG 6

	Solution/Oplossing	Marks/Punte
6.1	Amp = <u>2</u> ✓	(1)
6.2	min _{f+3} = -2 + 3 = <u>1</u> ✓	(1)
6.3		(3)
6.4.1	$f(180^\circ) - g(180^\circ) = y_f - y_g$ @ $x = 180^\circ$ $= 2 - 1 = 1$ ✓ answer only 2/2	(2)
6.4.2	$f(x) \cdot g(x) > 0 \therefore y_f \cdot y_g >$ $\therefore x \in (90^\circ; 270^\circ)$ ✓	(2)
6.5.1	$f: y = -2\cos x \therefore h: y = 2\cos x - 3$ ✓	(2)
6.5.2	$y = \cos x \therefore y \in [-1; 1]$ $y = 2\cos x \therefore y \in [-2; 2]$ $y = 2\cos x - 3 \therefore y \in [-5; -1]$ ✓	(2)
		[13]

1
 1
 3
 2
 2
 2
 2



QUESTION/VRAAG 7



don't penalise units

	Solution/Oplissing	Marks/Punte
7.1	$V = \frac{1}{3} (30 \times 30) \times 8 + 30 \times 30 \times 150$ $= 2400 + 135000$ $= 137400 \text{ cm}^3$	
7.2	$TSA = 4 \times \left(\frac{1}{2} (30) \cdot 17 \right)$ $= 4 \times 255$ $= 1020 \text{ cm}^2$	(3)
7.3	$V_{\text{new}} = \frac{1}{3} (15 \times 15) \times 8 + 15 \cdot 15 \cdot 150$ $= 600 + 33750$ $= 34350 \text{ cm}^3$ $\therefore no = \frac{137400}{34350} = 4$	(2)
	<p><i>hs = 17</i></p> <p><i>hs = 17</i></p> <p><i>must calculate answer</i></p> <p><i>answer only 0/2</i></p>	[8]

3

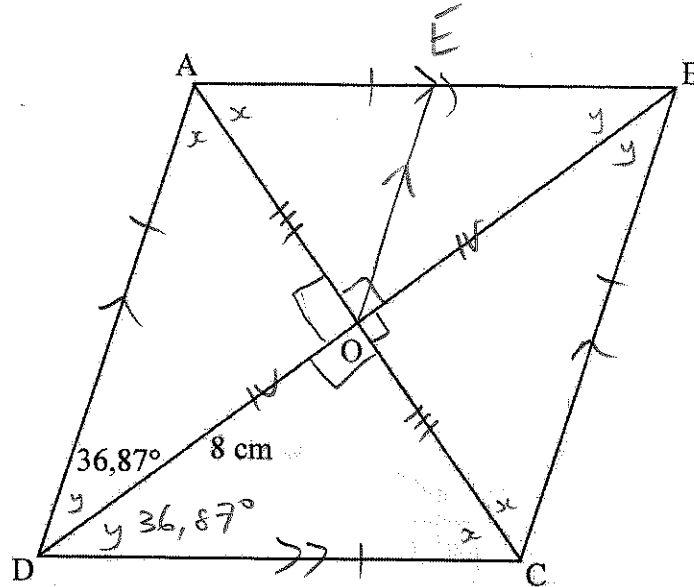
3

2



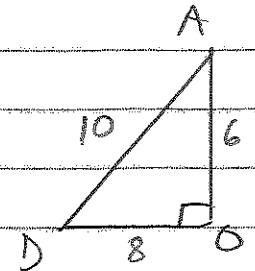
Give reasons for your statements in QUESTIONS 8 and 9.
 Gee redes vir jou bewerings in VRAAG 8 en 9.

QUESTION/VRAAG 8



	Solution/Oplissing	Marks/Punte
8.1.1	$\hat{CDO} = 36,87^\circ$ diagon rhom bisect int \wedge 's	
8.1.2	$\hat{AOD} = 90^\circ$ diagon rhom \perp	(1)
8.2	$\tan 36,87^\circ = \frac{AO}{8}$ $8 \cdot \tan 36,87^\circ = AO$ $6 \text{ cm} =$	(1)
		(2)



	Solution/Oplissing	Marks Punte
8.3	<p>AD = 10 Pythag ✓ SR</p> <p>AO = OC ✓ SR diags rhom bisect</p> <p>∴ OE ✓ R</p> <p>= $\frac{1}{2}(10)$ cons midpt thm</p> <p>= 5 ✓ S</p> <p>→</p> 	<p>(4)</p> <p>[8]</p>

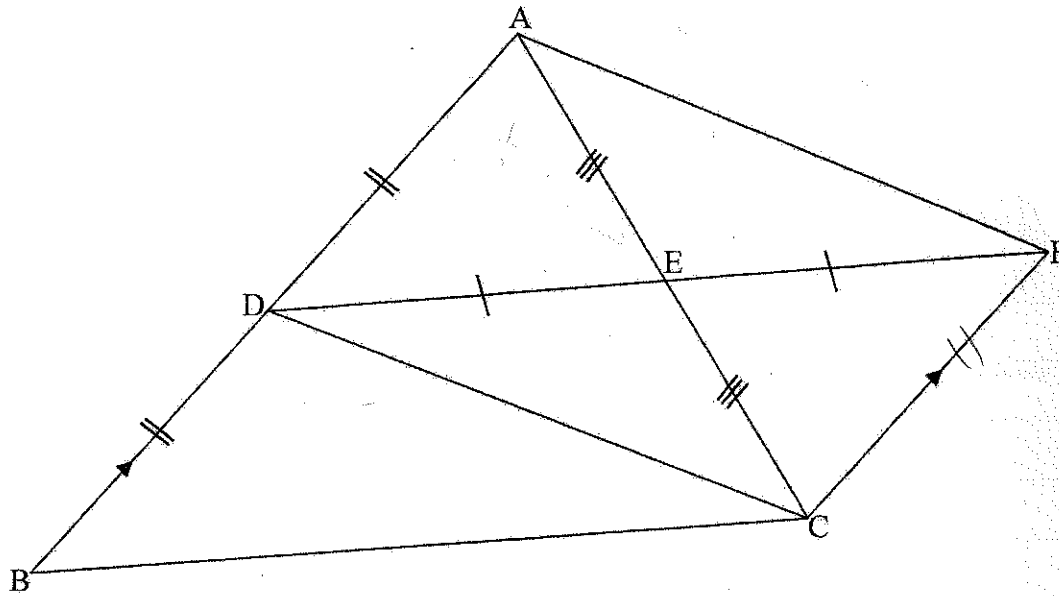
4

	Additional space/Bykomende ruimte	Marks Punte



QUESTION/VRAAG 9

9.1



	Solution/Oplissing	Marks Punte
9.1.1	<u>SAS</u> ✓	(1)
9.1.2	<u>1 pr opp sides // & =</u> ✓	
9.1.3	$DE = \frac{1}{2} \cdot DF$ ✓ ^s given $= \frac{1}{2} BC$ ✓ ^{sk} opp sides // gm =	(2)

1
1
2



AF = 4MB

9.2.3	<p>Let $MB = x$</p> <p>$SB = BA$</p> <p>$SM = MQ$ ✓ ^{SR} given drags \parallel gm bisect</p> <p>$\therefore AQ = 2x$ ✓ ^{SR} midpt thm ✓</p> <p>$\therefore RQ = 2x$ ✓ ^{SR} $AR = AQ$ (9.2.1)</p> <p>$\therefore AR = 2x + 2x$</p> <p style="margin-left: 40px;">$= 4x$</p> <p style="margin-left: 40px;">$= \underline{4 \cdot MB}$</p>	(4)
		[14]

4

	Additional space/Bykomende ruimte	Marks Punte
9.2.1.	<p>In Δ's SBP, ABQ</p> <p>1. $SB = BA$ ✓ ^{SR} given</p> <p>2. $\hat{S}_1 = \hat{A}_1$ ✓ ^{SR} alt \angle's = \parallel lines</p> <p>3. $\hat{B}_1 = \hat{B}_2$ ✓ ^{SR} vert opp \angle's =</p> <p>$\therefore \Delta SBP \cong \Delta ABQ$ AA con S ✓ ^{SR}</p> <p>$\therefore SP = AQ$ $\cong \Delta$'s.</p>	4

TOTAL/TOTAAL: 100

