

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

Selms

NATIONAL SENIOR CERTIFICATE
 NASIONALE SENIOR SERTIFIKAAT

MATHEMATICS P2/WISKUNDE V2

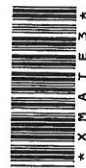
GRADE/GRAAD 10

NOVEMBER 2018

SPECIAL ANSWER BOOK
 SPESIALE ANTWOORDEBOEK

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

This answer book consists of 12 pages.
 Hierdie antwoordeboek bestaan uit 12 bladsye.



QUESTION/VRAAG 1

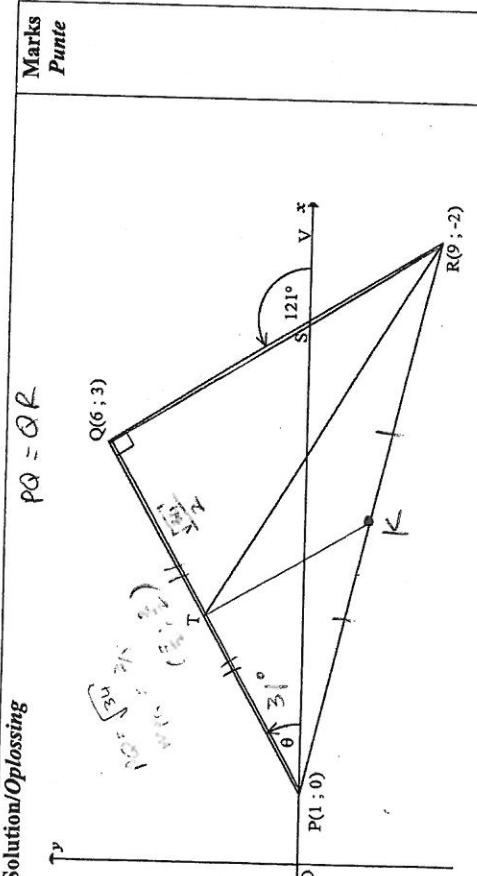
Solution/Oplissing		Marks Punte																								
1.1	<table border="1"> <thead> <tr> <th>MARKS OBTAINED/PUNTE BEHAAL</th> <th>FREQUENCY/FREKWENSIE</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>3</td></tr> <tr><td>2</td><td>4</td></tr> <tr><td>3</td><td>5</td></tr> <tr><td>4</td><td>3</td></tr> <tr><td>5</td><td>6</td></tr> <tr><td>6</td><td>0</td></tr> <tr><td>7</td><td>7</td></tr> <tr><td>8</td><td>9</td></tr> <tr><td>9</td><td>5</td></tr> <tr><td>10</td><td>0</td></tr> </tbody> </table> <p>5 vals carved other 6 val's carved</p>	MARKS OBTAINED/PUNTE BEHAAL	FREQUENCY/FREKWENSIE	0	0	1	3	2	4	3	5	4	3	5	6	6	0	7	7	8	9	9	5	10	0	2
MARKS OBTAINED/PUNTE BEHAAL	FREQUENCY/FREKWENSIE																									
0	0																									
1	3																									
2	4																									
3	5																									
4	3																									
5	6																									
6	0																									
7	7																									
8	9																									
9	5																									
10	0																									
1.2	$n = 0 + 3 + 4 + \dots + 0 = 42$	(2)																								
1.3.1	$\text{Range} = \text{max} - \text{min} = 9 - 1 = 8$	(1)																								
1.3.2	$\bar{x} = \frac{0 \times 0 + 1 \times 3 + 2 \times 4 + \dots + 10 \times 0}{42}$ $= \frac{234}{42} = 5,57$	(2)																								
	$s^2 = \frac{0 \times 0 + 1 \times 3 + 2 \times 4 + \dots + 10 \times 0}{42} - (5,57)^2$	(3)																								



1.4	$T_1, \dots, T_{42} \quad M = T_{\frac{1}{2}}(142) = T_{31.5}$ $= \frac{T_{21} + T_{22}}{2} = \frac{5 + 7}{2} = 6$	3	(3)
1.5	$a.o. \frac{3}{2}$	3	(3)
		14	

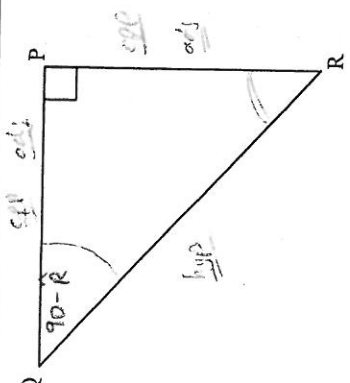
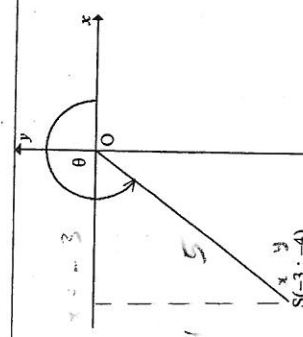
QUESTION/VRAAG 2

	Solution/Oplissing	Marks/Punte
2.1.1	$PQ = \sqrt{(3-0)^2 + (6-1)^2} = \sqrt{f+5}$ $= \sqrt{34} \quad \checkmark \text{ans}$	2
2.1.2	$MPQ = \frac{3-0}{6-1} = \frac{3}{5} \quad \checkmark f+5$ $= \frac{3}{5} \quad \checkmark \text{ans} > 0$	2




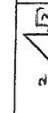
2.1.3	$x_T = \frac{1+6}{2} = \frac{7}{2}$ $y_T = \frac{0+3}{2} = \frac{3}{2}$ $\therefore T\left(\frac{7}{2}; \frac{3}{2}\right)$		2
2.2.1	$OR = \sqrt{34}$ $\text{also } \Delta OTE = \frac{1}{2} \left(\frac{\sqrt{34}}{2}\right) (\sqrt{34})$ $= \frac{17}{2} \quad \checkmark \text{ans}$	$PO = OQ \text{ given}$	3
2.2.2	$121^\circ = \theta + 90^\circ$ $31^\circ = \theta \quad \checkmark$	$\checkmark \text{ort } \wedge \Delta$	3
2.2.3	$MQS = -\frac{5}{3}$ $\frac{0-3}{x-6} = -\frac{5}{3}$ $\frac{-3}{x-6} = \frac{-5}{3}$ $-9 = -5(x-6)$ $\frac{9}{-5} = x-6$ $\frac{39}{-5} = x$	$OS \perp PQ \text{ given}$ $Q(6;3) \in (x;0)$ $\therefore S\left(\frac{39}{5}; 0\right)$	2
2.3	$MPQ = -\frac{5}{3}$	$OP \perp PQ \text{ given}$ $\checkmark \text{Midpt Thm}$ $\therefore MPQ = -\frac{5}{3} \quad \checkmark \text{grad's}$	3
		17	

QUESTION/VRAG 3

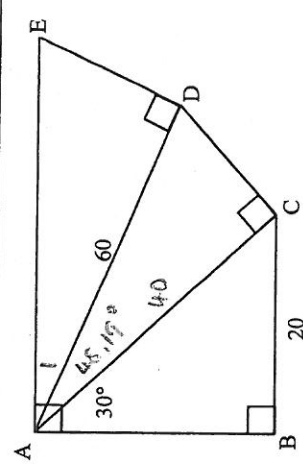
Solution/Opslossing	Marks/Punte
	
$\tan(90^\circ - R) = \tan Q = \frac{PR}{PQ}$ $\hat{Q} = 90^\circ - \hat{R} \text{ sum in } \Delta = 180^\circ$	(1)
$\frac{OR}{OP} = \frac{\text{hyp}}{\text{opp}} = \frac{\text{hyp}}{\text{adj}} = \sec Q$	(1)
<p>3.2</p> 	
$OS^2 = (-3)^2 + (-4)^2 = 9 + 16 = 25$ $OS = \pm \sqrt{25} = 5$	2
$\sec \theta = \frac{r}{x} = \frac{5}{-3} = -\frac{5}{3}$ $\sin^2 \theta = (\sin \theta)^2 = \left(\frac{4}{5}\right)^2 = \frac{16}{25}$ $\therefore \sec \theta + \sin^2 \theta = -\frac{5}{3} + \frac{16}{25} = \frac{-125 + 48}{75} = -\frac{77}{75}$	(3)

3.3

NO DIAGRAMS
NO MARKS
(NB)

$\csc 45^\circ = \frac{h}{o} = \frac{1}{1} = \sqrt{2}$		$\sin 90^\circ = \frac{y}{r} = \frac{1}{1} = \frac{1}{\sqrt{3}}$		3
$\csc 45^\circ = \sqrt{2}$		$\tan 60^\circ = \frac{o}{a} = \frac{1}{\sqrt{3}} = \sqrt{3}$		1
$\therefore \sin 90^\circ \cdot \tan 60^\circ = \frac{\sqrt{2}}{1 \cdot \sqrt{3}} = \frac{\sqrt{2}}{\sqrt{3}}$				(4)
				(11)

QUESTION/VRAG 4

Solution/Opslossing	Marks/Punte
	
<p>4.1.1</p> $\sin 30^\circ = \frac{20}{AC}$ $AC \cdot \sin 30^\circ = 20$ $AC = \frac{20}{\sin 30^\circ} = 40$	2
<p>4.1.2</p> $\cos \hat{CAD} = \frac{40}{60}$ $\hat{CAD} = \cos^{-1}\left(\frac{2}{3}\right) = 48,19^\circ$	(2)
<p>4.1.3</p> $\hat{A}_1 = 90^\circ - (30^\circ + 48,19^\circ) = 11,81^\circ$ $\tan 11,81^\circ = \frac{DE}{60}$ $60 \cdot \tan 11,81^\circ = DE$ $12,55 = DE$	(3)

4.2.1	$\tan x = 2,01$ $x = \tan^{-1}(2,01)$ $= 63,5^\circ$	2
4.2.2	$5 \cos x + 2 = 4$ $\cos x = \frac{2}{5}$ $x = \cos^{-1}\left(\frac{2}{5}\right)$ $= 66,4^\circ$	3
4.2.3	$\frac{\cos x}{\sin x} = 3$ $\therefore \frac{\cos x}{\sin x} = 3$ $1 = 6 \cdot \sin x$ $\frac{1}{6} = \sin x$ $\sin^{-1}\left(\frac{1}{6}\right) = x$ $9,6^\circ = x$	3
		15

QUESTION/VRAAGS

	Solution/Oplissing	Marks/Punte
5.1.1		3
5.1.2 (a)	Period of $f = 180^\circ$	(3)
5.1.2 (b)	$h: y = 3 \tan x$	(1)
5.2		(1)
5.2.1	$a = -2$ $b = 1$	2
5.2.2	$x \in (90^\circ; 270^\circ)$	(2)
		(1)

NE 1 dp

rounding to nearest

QUESTION/VRAAG 7

	Solution/Oplissing	Marks/Punte
7.1	Bisects the third side	(1)
7.2		
7.2.1	<p>$PS = QR$</p> <p>$\therefore OP = AC$ vs</p> <p>$\therefore \hat{A}_1 = 50^\circ$ vs R</p> <p>$\therefore \hat{R}_3 = 100^\circ$ vs R</p> <p>$\therefore \hat{A} = 100^\circ$ vs \checkmark</p> <p>opp sides \parallel gm =</p> <p>both = PS</p> <p>\therefore opp = sides</p> <p>ext \hat{A}</p> <p>\therefore all \hat{A}'s = , OR \parallel AS</p>	5
7.2.2	<p>$AP = PS$ vs R</p> <p>$\therefore RS = 120$ mm vs \checkmark</p> <p>$\therefore OP = 120$ mm vs R opp sides \parallel gm =</p> <p>line through midpt \parallel to 2nd side</p> <p>Midpt Thm</p> <p>a.o. $\frac{1}{3}$</p>	(5)
		(3)
		(9)

5.2.3	<p>$P_h: y \in [-4; 0]$</p> <p>$-4 \checkmark$</p> <p>-1 not in interval</p>	2
5.2.4	<p>Value = $-2 \cos 360^\circ$</p> <p>= -2</p>	2
		(2)
		(12)

QUESTION/VRAAG 6

	Solution/Oplissing	Marks/Punte
6.1	<p>$V = 117\pi$</p> <p>$r = 30$ mm</p> <p>= 3 cm</p> <p>$V = \pi r^2 \cdot h$</p> <p>$117\pi = \pi (3)^2 \cdot h$</p> <p>$\frac{117\pi}{9\pi} = h$</p> <p>$13 \text{ cm} = h$</p>	3
6.2	<p>80% full $\therefore h = \frac{80}{100} \cdot 13 = \frac{52}{5}$</p> <p>TSA = $(3) + 2\pi(3) \times \frac{52}{5}$</p> <p>= $28,27... + 196,03...$</p> <p>= $224,31 \text{ cm}^2$</p>	(3)
		4
		(4)
		(7)

QUESTION/VRAAG 8

Solution/Oplissing	Marks/Punte
<p>8.1</p> <p>EB = AB - AE ✓ DF = DC - FC ✓ but AB = DC ✓ and AE = FC ✓ ∴ EB = DF ✓ but EB ∥ DF ✓ ∴ EBF is a parallelogram ✓ ∴ DJ ∥ KB ✓</p>	5
<p>8.1.1</p> <p>EB = AB - AE ✓ DF = DC - FC ✓ but AB = DC ✓ and AE = FC ✓ ∴ EB = DF ✓ but EB ∥ DF ✓ ∴ EBF is a parallelogram ✓ ∴ DJ ∥ KB ✓</p>	5
<p>8.1.2</p> <p>Let $E_1 = x$ $B_2 = x$ $F_3 = x$ $F_1 = x$ $E_1 = F_1$</p> <p>∴ all angles =, DJ ∥ KB ✓ ∴ all angles =, AB ∥ CD ✓ ∴ both = x ✓</p>	4
	(4)

8.2		
8.2.1	<p>AO = OB ✓ AP = BP ✓ ∴ AOBP is a kite ✓ ∴ AT = TB ✓</p> <p>radii given 2 pts adj sides = ✓ diag kite bisected</p>	5
8.2.2	<p>$\hat{T}_1 = \hat{T}_2$ ∴ $\hat{OTA} = 90^\circ$</p> <p>∴ diagonals kite ⊥</p>	5
		(1)
		(15)

TOTAL/TOTAAL: 100



Additional working out:

5.1.2. (b) f: $y = -3 \tan x$

Reflect in x-axis $\cdot y \rightarrow -y$
 $\cdot x \rightarrow x$

h: $-y = -3 \tan x$
 $y = 3 \tan x \rightarrow$

5.2.1. $g(x) > 0$
 $y_g > 0$

$\therefore x \in (90^\circ; 270^\circ) \rightarrow$

5.2.3. $R_g: y \in [-2; 2]$

$h = g \downarrow^2$

$\therefore R_h: y \in [-4; 0] \rightarrow$

5.2.4. $-2(\cos 0^\circ + \cos 1^\circ + \dots + \cos 359^\circ \cos 360^\circ)$
 $= -2(\cos 0^\circ + \cos 1^\circ + \dots + \cos 179^\circ + \cos 180^\circ + \cos 181^\circ + \dots + \cos 359^\circ + \cos 360^\circ)$
 $= -2\cos 0^\circ - 2\cos 1^\circ - \dots - 2\cos 179^\circ - 2\cos 180^\circ - 2\cos 181^\circ - \dots - 2\cos 359^\circ - 2\cos 360^\circ$

ie the y-values of g at the various angle

$= \begin{matrix} \circ & \circ & \dots & \circ & \circ & \dots & \circ & \circ \\ - & - & \dots & - & - & \dots & - & - \\ \uparrow & \uparrow & \dots & \uparrow & \uparrow & \dots & \uparrow & \uparrow \\ \text{all cancel} & \text{all cancel} & & \text{all cancel} & \text{all cancel} & & \text{all cancel} & \text{all cancel} \end{matrix}$

$= \begin{matrix} \circ & \circ & \dots & \circ & \circ \\ + & + & \dots & + & + \\ \uparrow & \uparrow & \dots & \uparrow & \uparrow \\ \text{all cancel} & \text{all cancel} & & \text{all cancel} & \text{all cancel} \end{matrix}$
 $= -2 \rightarrow$
 $y_g \text{ @ } x = 360^\circ$

(b)

1.5. $T_1, \dots; T_{42} \quad M = T_{21,5}$

$\therefore T_1, \dots; T_{21} \quad T_{22}, \dots; T_{42}$

$Q_1 = T_{\frac{1}{2}(1+21)} = T_{11} = 3$
 $Q_3 = T_{\frac{1}{2}(22+42)} = T_{32} = 8$

I	min	1
II	Q_1	3
III	M	6
IV	Q_3	8
V	max	9

2.2.3. $M_{QR} = -\frac{5}{3} \quad QR \perp PQ \text{ given}$

QR: $y = -\frac{5}{3}x + c$

sub $Q(6;3)$
 $3 = -\frac{5}{3}(6) + c$

$13 = c$

$\therefore y = -\frac{5}{3}x + 13$

x-int: $0 = -\frac{5}{3}x + 13$
 $\frac{39}{5} = x$

$\therefore S(\frac{39}{5}; 0) \rightarrow$

(a)



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
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NASIONALE
SENIOR SERTIFIKAAT

GRADE/GRAAD 10

MATHEMATICS P2/WISKUNDE V2
NOVEMBER 2018
MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 100

Approved
Opombili
14/11/2018

These marking guidelines consist of 13 pages.
Hierdie nasienriglyne bestaan uit 13 bladsye.

DEPARTMENT OF BASIC
EDUCATION
PRIVATE BAG X896, PRETORIA 0001
2018 -11- 14
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Please turn over/Blaai om asseblief

NOTE:

- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:

- As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.
- Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.
- Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.

QUESTION/VRAAG 1

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Marks/Punte	Frequency/Frekwensie	
0	0	
1	3	
2	4	
3	5	
4	3	
5	6	
6	0	
7	7	
8	9	
9	5	
10	0	

42 learners/leerders

1.2 ✓ answer/antwoord (2)

1.3.1 Range/Variasiewydte
= 9 - 1
= 8
Answer only: 2/2 marks (1)

1.3.2 $\bar{x} = \frac{(1 \times 3) + (2 \times 4) + (3 \times 5) + (4 \times 3) + (5 \times 6) + (7 \times 7) + (8 \times 9) + (9 \times 5)}{42}$
 $= \frac{234}{42}$
 $= 5,57$
Answer only: 3/3 marks (2)

1.4 Position of the median/Posisie van die mediaan = $\frac{n+1}{2}$
= $\frac{21,5^{th}}{2}$ position/posisie
 $Q_2 = \frac{5+7}{2}$
= 6
Answer only: 3/3 marks (3)

1.5
Q1
Q3
rest of the box (3)

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<p>QUESTION/VRAAG 2</p> <p>2.1.1</p> $PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(1 - 6)^2 + (0 - 3)^2}$ $= \sqrt{25 + 9}$ $= \sqrt{34}$	<p>Answer only: 2/2 marks</p>	<p>✓ subst./verv. ✓ answer/antwoord (2)</p>
<p>2.1.2</p> $m_{PQ} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3 - 0}{6 - 1}$ $= \frac{3}{5}$	<p>Answer only: 2/2 marks</p>	<p>✓ subst./verv. ✓ answer/antwoord (2)</p>
<p>2.1.3</p> $x_T = \frac{x_1 + x_2}{2}$ $= \frac{1 + 6}{2}$ $= \frac{7}{2}$ $T\left(\frac{7}{2}; \frac{3}{2}\right)$	$y_T = \frac{y_1 + y_2}{2}$ $= \frac{0 + 3}{2}$ $= \frac{3}{2}$	<p>✓ x-value/x-waarde ✓ y-value/y-waarde (2)</p>
<p>2.2.1</p> $QR = QP = \sqrt{34}$ $QT = \frac{1}{2}PQ$ $QT = \frac{1}{2}\sqrt{34}$ $QT = \sqrt{\left(\frac{7}{2} - 6\right)^2 + \left(\frac{3}{2} - 3\right)^2}$ $QT = \frac{\sqrt{34}}{2}$	<p>Area of $\Delta QTR = \frac{1}{2}(QR)(QT)$</p> $= \frac{1}{2}(\sqrt{34})\left(\frac{1}{2}\sqrt{34}\right)$ $= \frac{17}{2} = 8,5 \text{ sq units/eenhede}$	<p>✓ answer/antwoord (3)</p>
<p>2.2.2</p> $\theta = 121^\circ - 90^\circ = 31^\circ$ <p>OR/OF $\angle QSP = 59^\circ$ $\theta = 31^\circ$ (\angle str line/hoek op reguitlyn) $(\angle$ sum Δ/binnehoek van Δ)</p>	<p>(ext \angle Δ/buitehoek van Δ)</p>	<p>✓ reason ✓ answer/antwoord (2) ✓ \angle sum Δ/binnehoek van Δ ✓ answer/antwoord (2)</p>
<p>2.2.3</p> $\cos \theta = \frac{PQ}{PS}$ $\cos 31^\circ = \frac{\sqrt{34}}{PS}$ $PS = \frac{\sqrt{34}}{\cos 31^\circ}$ $PS = 6,80$ <p>OR/OF $S(6,8 + 1; 0)$ $S(7,8; 0)$</p> <p>OR/OF $m_{QR} = -\frac{5}{3}$ $3 - 0 = -\frac{5}{3}(x - 3)$ $6 - x = -5x + 15$ $9 = -30 + 5x$ $x = 7,8$</p> <p>OR/OF $m_{QR} = -\frac{5}{3}$ Equation of QR $y - 3 = -\frac{5}{3}(x - 6)$ $y = -\frac{5}{3}x + 13$ $0 = -\frac{5}{3}x + 13$ $x = 7,8$ $S(7,8; 0)$</p>	<p>APPROVED MARKING GUIDELINE 2018 -11- 14 PRIVATE BAG X995, PRETORIA 0001 DEPARTMENT OF BASIC EDUCATION PUBLIC EXAMINATION</p>	<p>✓ $QR = \sqrt{34}$ $\frac{1}{2}\sqrt{34}$ ✓ answer/antwoord (3) ✓ reason ✓ answer/antwoord (2) ✓ \angle sum Δ/binnehoek van Δ ✓ answer/antwoord (2) $\cos \theta = \frac{PQ}{PS}$ or/of $\sin QSP = \frac{PQ}{PS}$ ✓ x-value/x-waarde ✓ y-value/y-waarde (3) $m_{QR} = m_{QS}$ $y = 0$ ✓ x-value/x-waarde (3) ✓ equation of QR/ ✓ verhouding van QR $y = 0$ ✓ x-value/x-waarde (3)</p>

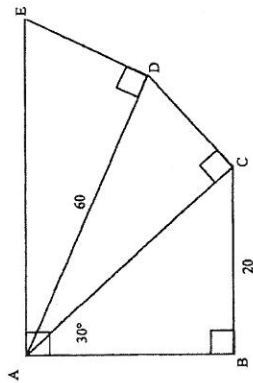
3.3	$\text{cosec } 45^\circ = \frac{1}{\sin 90^\circ \cdot \tan 60^\circ}$ $= \frac{1}{(1)(\sqrt{3})}$ $= \frac{1}{\sqrt{3}} \div \sqrt{3}$ $= \frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}}$ $= \frac{1}{3}$ <p>OR/OF</p> $\text{cosec } 45^\circ = \frac{1}{\sin 90^\circ \cdot \tan 60^\circ}$ $= \frac{1}{(1)(\sqrt{3})}$ $= \frac{\sqrt{2}}{\sqrt{3}}$		$\checkmark \frac{\sqrt{2}}{\sqrt{3}}$ $\checkmark 1$ $\checkmark \sqrt{3}$	\checkmark answer/antwoord (4)
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2.3	$m_{QR} = \frac{3 - (-2)}{6 - (9)}$ $= -\frac{5}{3}$ $m_{T-\text{midpoint}} = m_{QR} \text{ (Midpoint Theorem)}$ $m_{T-\text{midpoint}} = -\frac{5}{3}$ <p>OR/OF</p> $\text{Midpoint PR} \left(\frac{9+1}{2}, \frac{-2+0}{2} \right)$ $\text{Midpoint PR}(5; -1)$ $m_{T-\text{mid en PR}} = \frac{3 - (-1)}{2 - (-5)}$ $= -\frac{5}{3}$	$\checkmark m_{QR}$ $\checkmark m_{T-\text{midpoint}} = m_{QR}$ \checkmark Midpoint theorem/ Middelpuntstelling (3) \checkmark midpoint of PR \checkmark subst \checkmark answer		(3) 117
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QUESTION/VRAAG 3

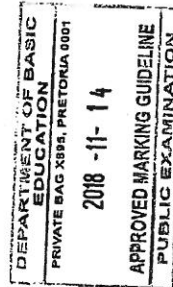
3.1.1	$\tan(90^\circ - R) = \frac{PR}{QP} \text{ OR/OF } \frac{q}{r}$	\checkmark answer/antwoord (1)
3.1.2	sec Q OR/OF cosec R OR/OF cosec (90° - Q) OR/OF sec (90° - R)	\checkmark answer/antwoord (1) \checkmark answer/antwoord (1) \checkmark answer/antwoord (1) \checkmark answer/antwoord (1) \checkmark answer/antwoord (1)
3.2.1	$OS = \sqrt{(-3)^2 + (-4)^2}$ (Pythagoras) $= 5$	\checkmark subst./verv. \checkmark answer/antwoord (2)
3.2.2	$\sec\theta + \sin^2\theta$ $= -\frac{5}{3} + \left(-\frac{4}{5}\right)^2$ $= -\frac{5}{3} + \frac{16}{25}$ $= -\frac{77}{75}$	$\checkmark -\frac{5}{3}$ $\checkmark \frac{4}{5}$ $\checkmark -\frac{77}{75}$

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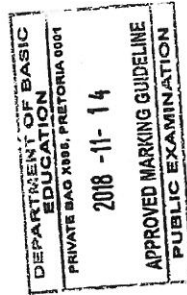


QUESTION/VRAG 4

4.1.1	$\sin 30^\circ = \frac{20}{AC}$ $AC = \frac{20}{\sin 30^\circ}$ $AC = 40$ OR/OF $\cos 60^\circ = \frac{20}{AC}$ $AC = \frac{20}{\cos 60^\circ}$ $AC = 40$	$\operatorname{cosec} 30^\circ = \frac{AC}{20}$ OR/OF $AC = \frac{20}{\sin 30^\circ}$ $AC = 40$ $\sec 60^\circ = \frac{AC}{20}$ OR/OF $AC = \frac{20}{\cos 60^\circ}$ $AC = 40$	$\checkmark \sin 30^\circ = \frac{20}{AC}$ or $\operatorname{cosec} 30^\circ = \frac{AC}{20}$ $\checkmark \operatorname{answer/antwoord}$ (2) $\checkmark \cos 60^\circ = \frac{20}{AC}$ or $\sec 60^\circ = \frac{AC}{20}$ $\checkmark \operatorname{answer/antwoord}$ (2)
4.1.2	$\cos \hat{C}AD = \frac{AC}{60}$ $\cos \hat{C}AD = \frac{40}{60}$ $\hat{C}AD = 48,19^\circ$		$\checkmark \cos \hat{C}AD = \frac{AC}{60}$ $\checkmark \operatorname{answer/antwoord}$ (2)
4.1.3	$\hat{D}AE = 90^\circ - (30^\circ + \hat{C}AD)$ $\hat{D}AE = 90^\circ - (30^\circ + 48,19^\circ)$ $= 11,81^\circ$ $\tan 11,81^\circ = \frac{DE}{60}$ $DE = 60 \tan 11,81^\circ$ $DE = 12,55$		$\checkmark \hat{D}AE = 11,8^\circ$ $\checkmark \tan 11,81^\circ = \frac{DE}{60}$ $\checkmark \operatorname{answer/antwoord}$ (3)



4.2.1	$\tan x = 2,01$ $x = 63,5^\circ$	If the rounding is incorrect: max 1/2 marks	$\checkmark \checkmark \operatorname{answer/antwoord}$ (2)
4.2.2	$5 \cos x + 2 = 4$ $5 \cos x = 2$ $\cos x = \frac{2}{5}$ $x = 66,4218\dots^\circ$ $x = 66,4^\circ$		$\checkmark 5 \cos x = 2$ $\checkmark \cos x = \frac{2}{5}$ $\checkmark \operatorname{answer/antwoord}$ (3)
4.2.3	$\frac{\operatorname{cosec} x}{2} = 3$ $\operatorname{cosec} x = 6$ $\frac{1}{\sin x} = 6$ $\sin x = \frac{1}{6}$ $x = 9,6^\circ$		$\checkmark \operatorname{cosec} x = 6$ $\checkmark \sin x = \frac{1}{6}$ $\checkmark \operatorname{answer/antwoord}$ (3)



QUESTION/VRAAG 7

7.1	Bisects the third side/Halveer die derde sy		✓ answer/antwoord	(1)
7.2				
7.2.1	<p>CR = PS (given)</p> <p>PS = QR (opp sides //m ⇒)</p> <p>CR = QR (∠s opp = sides)</p> <p>∠1 = ∠1 = 50° (ext ∠ Δ)</p> <p>∠3 = 100° (alt ∠s; QR AS)</p> <p>∠A = 100°</p>		<p>✓ CR = QR</p> <p>✓ ∠1 = ∠1 = 50°</p> <p>✓ ∠3 = 100°</p> <p>✓ ∠A = 100°</p> <p>✓ Reason</p>	(5)
7.2.2	<p>AP = PS (line from midpoint // to one side of triangle)</p> <p>RS = 120 (midpoint theorem)</p> <p>QP = 120 (opp sides //m ⇒)</p> <p>OR/OF</p> <p>In ΔQBR and ΔPBA</p> <p>1. $\hat{R}_3 = \hat{A}$ (proven) or (alt ∠s; QR QS)</p> <p>2. $\hat{B}_1 = \hat{B}_3$ (vert opp ∠s)</p> <p>3. BR = BA (given)</p> <p>ΔQBR = ΔPBA (∠/∠S)</p> <p>QB = BP = 60 (≅ Δs)</p> <p>QP = 120</p>	<p>AP = PS</p> <p>RS = 120</p> <p>QP = 120</p> <p>OR/OF</p> <p>In ΔQBR and ΔPBA</p> <p>1. $\hat{R}_3 = \hat{A}$ (proven) or (alt ∠s; QR QS)</p> <p>2. $\hat{B}_1 = \hat{B}_3$ (vert opp ∠s)</p> <p>3. BR = BA (given)</p> <p>ΔQBR = ΔPBA (∠/∠S)</p> <p>QB = BP = 60 (≅ Δs)</p> <p>QP = 120</p>	<p>✓ AP = PS</p> <p>✓ Reason</p> <p>✓ QP = 120</p>	(3)
			<p>✓ ΔQBR = ΔPBA</p> <p>✓ QB = BP</p> <p>✓ QP = 120</p>	(3)
				9

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Please turn over/Blaai om asseblief

QUESTION/VRAAG 5

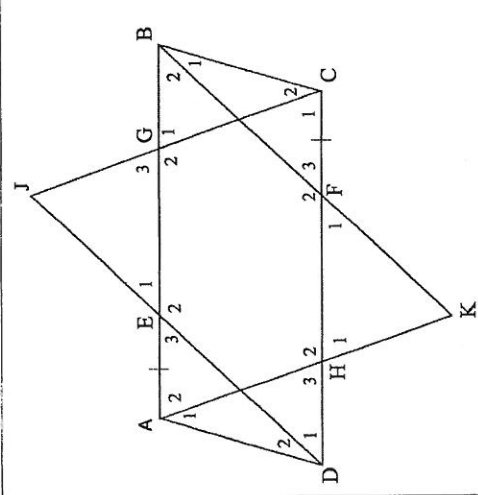
5.1.1	<p>✓ Tan graph passing through (45°, -3) or (135°, 3) or (225°, -3) or (315°, 3)</p> <p>✓ x-intercepts/x-snyppunte</p> <p>✓ both asymptotes/albei asymptote</p>			(3)
5.1.2(a)	180°	✓ answer/antwoord		(1)
5.1.2(b)	$h(x) = 3 \tan x$	✓ answer/antwoord		(1)
5.2.1	$a = -2$ $b = 1$	✓ a ✓ b		(2)
5.2.2	$90^\circ < x < 270^\circ$ OR/OF $x \in (90^\circ ; 270^\circ)$	✓ answer/antwoord		(1)
5.2.3	$-4 \leq y \leq 0$	✓ critical values/kritieke waardes <p>OR/OF</p> <p>$y \in [-4 ; 0]$</p>	✓ notation/notasie	(2)
5.2.4	$-2(\cos 0^\circ + \cos 1^\circ + \cos 2^\circ + \dots + \cos 358^\circ + \cos 359^\circ + \cos 360^\circ)$ $= -2(1)$ $= -2$	✓ answer/antwoord		(2)

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6.1	<p>$r = 3$ cm</p> <p>$V = \pi r^2 h$</p> <p>$117\pi = \pi(3)^2 h$</p> <p>$h = 13$ cm</p>	<p>✓ $r = 3$ cm</p> <p>✓ subst./vern.</p> <p>✓ answer/antwoord</p>	(3)
6.2	<p>TSA/TBO</p> <p>$= \pi r^2 + 2\pi r h$</p> <p>$= \pi(3)^2 + 2\pi(3)(13) \times 0,8$</p> <p>$= 224,31 \text{ cm}^2$</p> <p>OR/OF</p> <p>TSA/TBO</p> <p>$= \pi r^2 + 2\pi r h$</p> <p>$= \pi(3)^2 + 2\pi(3)(10,4)$</p> <p>$= 224,31 \text{ cm}^2$</p>	<p>✓ $\pi r^2 + 2\pi r h$</p> <p>✓ subst./vern.</p> <p>✓ 80% of height/van hoogte</p> <p>✓ answer</p>	(4)
			7

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QUESTION/VRAAG 8



8.1.1
 $AB = DC$
 $AE + EB = DF + FC$ (opp sides of a parallelogram equal)
 $AE = CF$ (given)
 $\therefore EB = DF$
 $DF \parallel EB$ (opp sides parallelogram parallel)
 $EDFB$ is a parallelogram (one pair opp sides = and \parallel)
 $\therefore ED \parallel FB$
 $\therefore DJ \parallel BK$

OR/OF
 In $\triangle AED$ and $\triangle CFB$
 1. $FC = AE$ (given)
 2. $\hat{C}_1 + \hat{C}_2 = \hat{A}_1 + \hat{A}_2$ (opp \angle \parallel lines \Rightarrow)
 3. $BC = AD$ (opp sides \parallel lines \Rightarrow)
 $\triangle AED \cong \triangle CFB$ (SAS)
 $\hat{E}_3 = \hat{F}_3$ (\cong Δ s)
 $\hat{E}_3 = \hat{D}_1$ (alt \angle s; $AB \parallel DC$)
 $\hat{F}_3 = \hat{D}_1$
 $DJ \parallel BK$ (corres \angle s \Rightarrow)

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OR/OF

In $\triangle AED$ and $\triangle CFB$
 1. $FC = AE$ (given)
 2. $\hat{C}_1 + \hat{C}_2 = \hat{A}_1 + \hat{A}_2$ (opp \angle \parallel lines \Rightarrow)
 3. $BC = AD$ (opp sides \parallel lines \Rightarrow)
 $\triangle AED \cong \triangle CFB$ (SAS)
 $DE = FB$ (\cong Δ s)
 $AB = DC$
 $AE + EB = DF + FC$ (opp sides of a parallelogram equal)
 $AE = CF$ (given)
 $\therefore EB = DF$
 $EDFB$ is a parallelogram (both pairs opp sides \Rightarrow)
 $DE \parallel FB$ (opp sides \parallel lines \Rightarrow)
 $DJ \parallel KB$

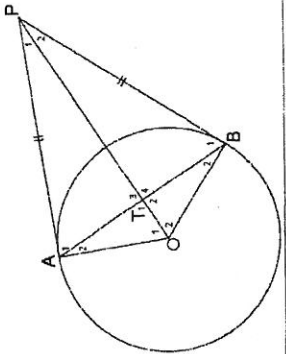
8.1.2
 $\hat{E}_1 = \hat{D}_1$ (corres. \angle s, $AB \parallel DC$)
 $\hat{F}_1 = \hat{D}_1$ (alt. \angle s, $DE \parallel FB$)
 $\therefore \hat{E}_1 = \hat{F}_1$
OR/OF
 $\hat{E}_3 = \hat{D}_1$ (alt. \angle s, $AB \parallel DC$)
 $\hat{F}_3 = \hat{D}_1$ (alt. \angle s, $DE \parallel FB$)
 $\therefore \hat{E}_3 = \hat{F}_3$
 $\hat{E}_3 = \hat{E}_1$ (vert. opp. \angle s)
 $\therefore \hat{E}_1 = \hat{F}_1$

OR/OF
 $\hat{E}_1 = \hat{D}_1$ (corres \angle s, $AB \parallel DC$)
 $\hat{F}_3 = \hat{D}_1$ (corres \angle s, $DE \parallel FB$)
 $\therefore \hat{E}_3 = \hat{F}_1$
 $\hat{F}_3 = \hat{F}_1$ (vert. opp. \angle s)
 $\therefore \hat{E}_1 = \hat{F}_1$
OR/OF
 $EDFB$ is a parallelogram (proven in 8.1.1)
 $\hat{E}_2 = \hat{F}_2$ (opp \angle s \parallel lines \Rightarrow)
 $\hat{E}_1 = \hat{F}_1$ (\angle s on straight line)

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**MATHEMATICS MARKING GUIDELINES NOTES
 GRADE 10 PAPER 2**

These notes are to be used in conjunction with the marking guideline for Mathematics Grade 10 Paper 2 2018.

8.2	 <p>AP = BP (given) OA = OB (radii) OAPB is a kite (two pairs adj sides =) AT = TB (one diag of kite bisects the other)</p> <p>OR/OF In $\triangle OAP$ and $\triangle OBP$ 1. AP = BP (given) 2. OA = OB (radii) 3. OP is common $\therefore \triangle OAP \cong \triangle OBP$ (SSS)</p> <p>$\hat{O}_1 = \hat{O}_2$ ($\cong \Delta s$) In $\triangle OAT$ and $\triangle OTB$ 1. $\hat{O}_1 = \hat{O}_2$ ($\cong \Delta s$) 2. OA = OB (radii) 3. OT is common $\therefore \triangle OAT \cong \triangle OTB$ (S/S/S) AT = TB ($\cong \Delta s$)</p>	<p>✓ S ✓ OA = OB ✓ OAPB is a kite/<i>n vlieër</i> ✓ two pairs adj sides = ✓ reason/<i>rede</i> (5)</p> <p>✓ AP = BP ✓ OA = OB</p> <p>✓ $\hat{O}_1 = \hat{O}_2$ or $\hat{P}_1 = \hat{P}_2$ ($\cong \Delta s$)</p> <p>✓ $\therefore \triangle OAT \cong \triangle OTB$ or $\triangle PAT \cong \triangle PBT$ $\checkmark \cong \Delta s$</p>	(5)
8.2.2	<p>$\hat{O}\hat{T}A = 90^\circ$ (properties of a kite)</p> <p>OR/OF $\hat{O}\hat{T}A = \hat{O}\hat{T}B$ ($\triangle OTA \cong \triangle OTB$) but: $\hat{O}\hat{T}A + \hat{O}\hat{T}B = 180^\circ$ ($\angle s$ on a str. line) $\therefore \hat{O}\hat{T}A = 90^\circ$</p>	<p>✓ R (1)</p> <p>✓ R (1)</p>	(1)
			[15]

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TOTAL/TOTAAL: 100	

CP

1.1	If learners leave the frequency blank for 0; 6; 10, mark this as a 0 frequency.	0/2 marks
1.3.1	$10 - 0 = 10$	
1.3.2	This question must be marked in conjunction with the learner's frequency table. $0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$ $\frac{n}{\text{sum of only frequencies}}$ max marks: 1/3 (for n) max marks: 1/3 (for n)	
2.1.1	Accept: 5,83 Wrong formula: 0/2 marks	
2.1.2	Wrong formula: 0/2 marks	
4.1.1	If the ratio is incorrect this is considered a breakdown: 0 marks	
4.1.2		
4.1.3		
4.2.2	No penalty for incorrect rounding.	
4.2.3	No penalty for incorrect rounding.	
6.2	TSA/TBO $= 2\pi r^2 + 2\pi r h$ $= 2\pi(3)^2 + 2\pi(3)(13) \times 0,8$ $= 252,58 \text{ cm}^2$ If formula is completely incorrect: max 1/4 marks (for the height indicated as 80% of the original height)	max 3/4 marks

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Approved
 Opasendel
 14/11/2018