

Need an amazing tutor?

www.teachme2.com/matric



Collected and collated by

teachme2



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS ***SENIORSERTIFIKAAT-EKSAMEN***

MATHEMATICS P2/*WISKUNDE V2*

2018

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS: 150
PUNTE: 150

These marking guidelines consist of 21 pages.
Hierdie nasienriglyne bestaan uit 21 bladsye.

NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt of a question and not redone the question, mark the crossed out version.
- Consistent accuracy applies in ALL aspects of the marking memorandum. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

LET WEL:

- *As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek en nie oordoen nie, sien die doodgetrekte poging na.*
- *Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyne toegepas. Hou op nasien by die tweede berekeningsfout.*
- *Aanvaar van antwoorde/waardes om 'n probleem op te los, word NIE toegelaat nie.*

GEOMETRY	
S	A mark for a correct statement (A statement mark is independent of a reason.)
	'n Punt vir 'n korrekte bewering ('n Punt vir 'n bewering is onafhanklik van die rede.)
R	A mark for a correct reason (A reason mark may only be awarded if the statement is correct.)
	'n Punt vir 'n korrekte rede ('n Punt word slegs vir die rede toegeken as die bewering korrek is.)
S/R	Award a mark if the statement AND reason are both correct.
	Ken 'n punt toe as beide die bewering EN rede korrek is.

QUESTION/VRAAG 1

110	112	156	164	167	169
171	176	192	228	278	360

1.1.1	$\text{Mean/Gemiddelde} = \frac{2283}{12}$ $= 190,25$ <p>Mean profit/Gemiddelde wins = R190 250,00 or 190,25 thousand rands</p>	✓ sum/som ✓ answer ✓ answer in thousands of rands (3)
1.1.2	$\text{Median} = \frac{169 + 171}{2} = 170 \text{ thousand rands}$ $= \text{R}170\,000$	✓ answer (1)
1.2		✓ whiskers ✓ quartiles (2)
1.3	$\text{IQR} = Q_3 - Q_1$ $= 210 - 160 \text{ thousand rands}$ $= \text{R}50\,000$	✓ answer (1)
1.4	Skewed to the right or positively skewed.	✓ answer (1)
1.5.1	$\sigma = 67,04118759 \text{ thousand rands}$ $= \text{R}67\,041,19$	✓ answer (1)
1.5.2	$\bar{x} - \sigma = 123,21 \text{ thousand rands}$ <p>For 2 months the profit was less than one standard deviation below the mean.</p>	✓ lower limit ✓ answer (2)
		[11]

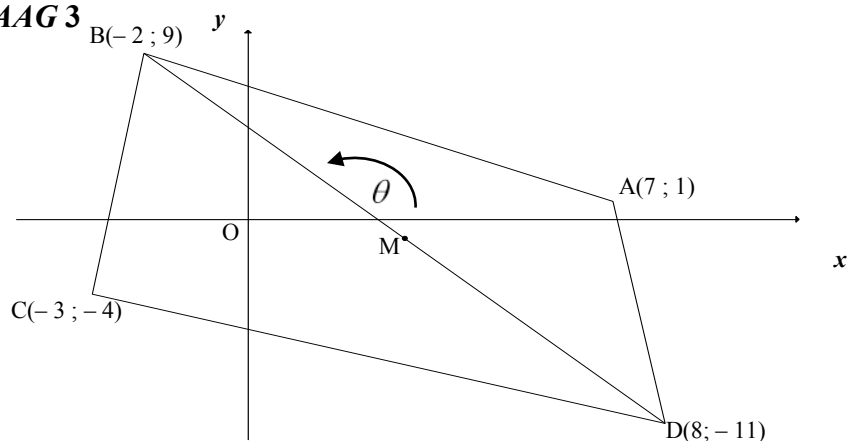
QUESTION/VRAAG 2

CHIRPS/TJIRPGELUIDE PER MINUTE/ PER MINUUT	AIR TEMPERATURE/ LUGTEMPERATUUR IN °C
32	8
40	10
52	12
76	15
92	17
112	20
128	25
180	28
184	30
200	35

2.1	<p style="text-align: center;">SCATTER PLOT/SPREIDIAGRAM</p>	<p>3 marks: All points correct</p> <p>2 marks: 6 – 9 points correct</p> <p>1 mark: 3 – 5 points correct</p> <p style="text-align: right;">(3)</p>
2.2	<p>The points lie almost in a straight line. This suggests a very strong positive relationship between the number of chirps per minute and the temperature of the air.</p> <p><i>Die punte lê amper in 'n reguitlyn, wat beteken dat daar 'n baie sterk positiewe verband tussen die aantal tjirpgeluide per minuut en die lugtemperatuur is.</i></p> <p>OR/OF</p> <p>$r = 0,99$ so there is a very strong positive relationship between the number of chirps per minute and the temperature of the air.</p> <p><i>$r = 0,99$, dus is daar 'n baie sterk positiewe verband tussen die aantal krieggeluide per minuut en die lugtemperatuur.</i></p>	<p>✓ justify with straight line / <i>Motivering mbv reguitlyn</i></p> <p style="text-align: right;">(1)</p> <p>✓ link with / <i>gebruik $r = 0,99$ om te motiveer</i></p> <p style="text-align: right;">(1)</p>

2.3	$a = 3,97$ $b = 0,15$ $\hat{y} = 3,97 + 0,15x$	✓ $a = 3,97$ ✓ $b = 0,15$ ✓ equation (3)
2.4	Air temperature $\approx 15,67^{\circ}\text{C}$ (calculator) OR $\hat{y} \approx 3,97 + 0,15(80)$ $\approx 15,97^{\circ}\text{C}$ OR Air temperature $\approx 16^{\circ}\text{C}$ (graph: Accept between 15°C and 17°C)	✓✓ answer (2) ✓ substitution ✓ answer (2) ✓✓ answer (2)
		[9]

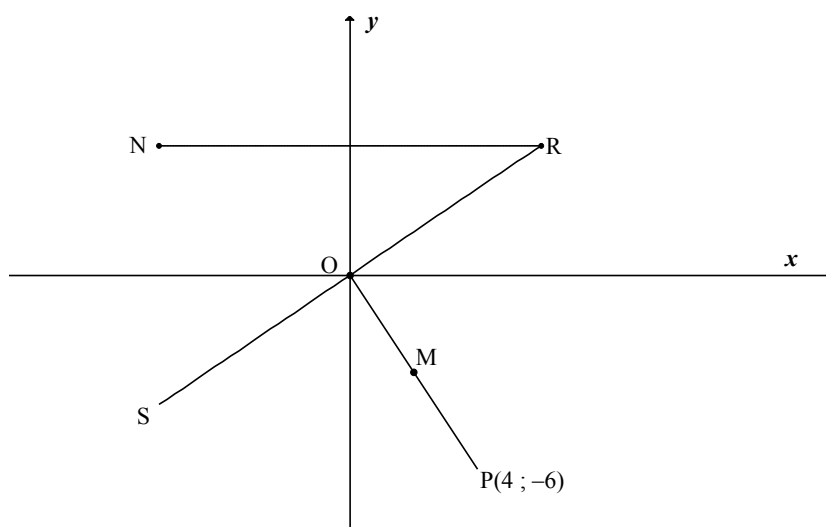
QUESTION/VRAAG 3



3.1	$m_{AC} = \frac{1 - (-4)}{7 - (-3)} \text{ OR } \frac{-4 - 1}{-3 - 7}$ $= \frac{5}{10} = \frac{1}{2}$	✓ substitution ✓ answer (2)
3.2.1	$y = \frac{1}{2}x + c$ $1 = \frac{1}{2}(7) + c$ $c = -\frac{5}{2}$ $y = \frac{1}{2}x - 2\frac{1}{2}$ OR/OF $y = \frac{1}{2}x + c$ $-4 = \frac{1}{2}(-3) + c$ $c = -\frac{5}{2}$ $y = \frac{1}{2}x - 2\frac{1}{2}$ $y - y_1 = \frac{1}{2}(x - x_1)$ $y - 1 = \frac{1}{2}(x - 7)$ $y - 1 = \frac{1}{2}x - \frac{7}{2}$ $y = \frac{1}{2}x - 2\frac{1}{2}$ OR/OF $y - y_1 = \frac{1}{2}(x - x_1)$ $y - (-4) = \frac{1}{2}(x - (-3))$ $y + 4 = \frac{1}{2}x + \frac{3}{2}$ $y = \frac{1}{2}x - 2\frac{1}{2}$	✓ substitution M and A(7 ; 1) ✓ equation (2) ✓ substitution M and C(-3 ; -4) ✓ equation (2)

3.2.2	$M\left(\frac{-2+8}{2}; \frac{9+(-11)}{2}\right)$ $\therefore M(3; -1)$ <p>Equation of AC: $y = \frac{1}{2}x - 2\frac{1}{2}$ OR/OF $y = \frac{1}{2}x - 2\frac{1}{2}$</p> $y = \frac{1}{2}(3) - 2\frac{1}{2} \qquad -1 = \frac{1}{2}x - 2\frac{1}{2}$ $y = -1 \qquad x = 3$ <p>$\therefore M$ lies on AC</p> <p>OR/OF</p> $M\left(\frac{-2+8}{2}; \frac{9+(-11)}{2}\right)$ $\therefore M(3; -1)$ $m_{CM} = \frac{-4+1}{-3-3} = \frac{1}{2}$ <p>$\therefore m_{CM} = m_{AC}$ and C a common point</p> <p>$\therefore M$ lies on AC</p>	<p>✓ x coordinate ✓ y coordinate</p> <p>✓ substitution of x</p> <p>✓ conclusion (4)</p> <p>✓ x coordinate</p> <p>✓ y coordinate</p> <p>✓ gradient of CM</p> <p>✓ reasoning & conclusion (4)</p>
3.3	$m_{BD} = \frac{9-(-11)}{-2-8} \quad \text{OR} \quad \frac{(-11)-9}{8-(-2)}$ $= -2$ $m_{BD} \times m_{AC} = \frac{1}{2} \times -2$ $= -1$ <p>$\therefore BD \perp AC$</p>	<p>✓ correct substitution</p> <p>✓ m_{BD}</p> <p>✓ product of gradients = -1 (3)</p>
3.4.1	$\tan \theta = m_{BD} = -2$ $\therefore \theta = 116,57^\circ$	<p>✓ $\tan \theta = m_{BD}$</p> <p>✓ answer (2)</p>
3.4.2	$\tan \beta = m_{BC}$ $m_{BC} = \frac{9-(-4)}{-2-(-3)} \quad \text{OR} \quad \frac{-4-9}{-3-(-2)}$ $= 13$ $\beta = 85,6^\circ$ $\therefore \hat{C}BD = 116,57^\circ - 85,60^\circ \quad [\text{ext } \angle \text{ of } \Delta]$ $= 30,97^\circ$ <p>OR/OF</p> $BD = \sqrt{500}; BC = \sqrt{170} \text{ \& } CD = \sqrt{170}$ $CD^2 = BD^2 + BC^2 - 2BD \cdot BC \cdot \cos \hat{C}BD$ $170 = 500 + 170 - 2\sqrt{500} \cdot \sqrt{170} \cdot \cos \hat{C}BD$ $\cos \hat{C}BD = \frac{\sqrt{500}}{2\sqrt{170}} = 0,85749...$ $\hat{C}BD = 30,96^\circ$	<p>✓ $m_{BC} = 13$</p> <p>✓ value of β</p> <p>✓ answer (3)</p> <p>✓ subst into cos rule</p> <p>✓ value of $\cos \hat{C}BD$</p> <p>✓ answer (3)</p>

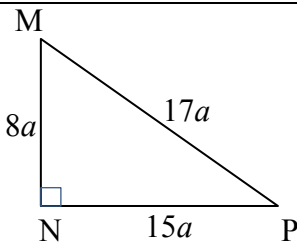
3.4.3	$AC = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ $= \sqrt{(7 - (-3))^2 + (1 - (-4))^2} \text{ OR } \sqrt{((-3) - 7)^2 + ((-4) - 1)^2}$ $= \sqrt{100 + 25}$ $= \sqrt{125} = 5\sqrt{5} = 11,58$	✓ correct substitution into distance formula ✓ answer (2)
3.4.4	$BM = \sqrt{((-2) - 3)^2 + (9 - (-1))^2} \text{ OR } \sqrt{(3 - (-2))^2 + ((-1) - 9)^2}$ $= \sqrt{125} = 5\sqrt{5}$ $\text{Area of } \triangle ABC = \frac{1}{2} \text{ base} \times \perp \text{ height}$ $= \frac{1}{2} (\sqrt{125})(\sqrt{125})$ $= 62,5 \text{ square units}$ $\text{Area of ABCD} = 2 \times 62,5$ $= 125 \text{ square units}$	✓ correct substitution into distance formula ✓ BM ✓ substitution into area formula ✓ 62,5 ✓ $2 \times \triangle ABC$ (5)
		[23]

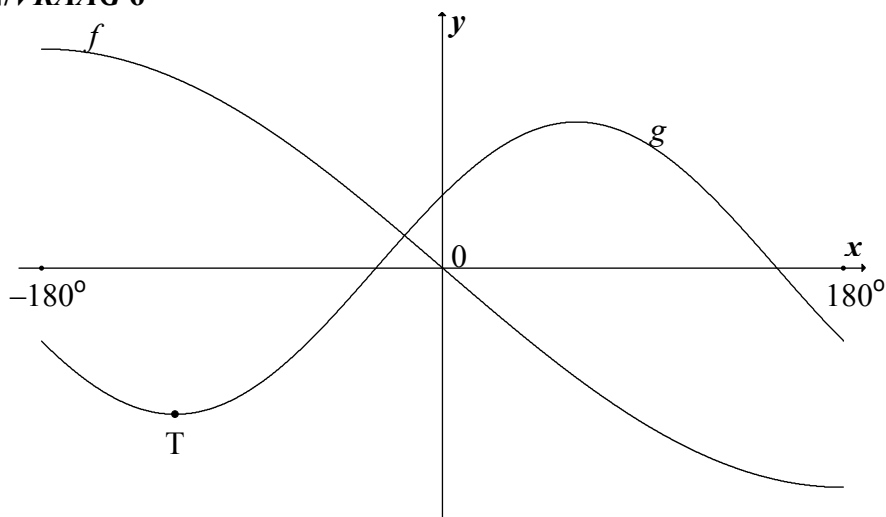
QUESTION/VRAAG 4

4.1	$M\left(\frac{0+4}{2}; \frac{0+(-6)}{2}\right)$ $\therefore M(2; -3)$	✓ 2 ✓ -3 (2)
4.2.1	$x^2 + y^2 = 4^2 + (-6)^2$ $= 52$ $\therefore x^2 + y^2 = 52$	✓ substitution ✓ equation (2)
4.2.2	$(x-2)^2 + (y+3)^2 = \left(\frac{\sqrt{52}}{2}\right)^2 = 13$ $x^2 - 4x + 4 + y^2 + 6y + 9 - 13 = 0$ $x^2 + y^2 - 4x + 6y = 0$	✓ substitution of M ✓ substitution of radius = $\frac{\sqrt{52}}{2}$ ✓ answer (3)
4.2.3	$m_{OP} = \frac{-6}{4} = -\frac{3}{2}$ $m_{RS} \times m_{OP} = -1 \quad [\text{radius} \perp \text{tangent} / \text{raaklyn}]$ $\therefore m_{RS} = \frac{2}{3}$ $\therefore y = \frac{2}{3}x$	✓ m_{OP} ✓ m_{RS} ✓ equation (3)

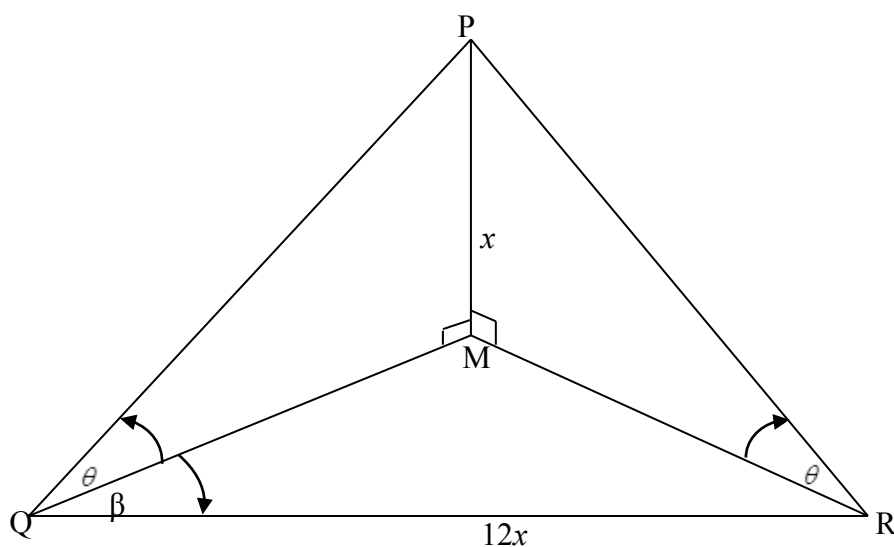
4.3	$x^2 + y^2 = 52 \text{ and } y = \frac{2}{3}x$ $x^2 + \left(\frac{2}{3}x\right)^2 = 52$ $x^2 + \frac{4}{9}x^2 = 52$ $1\frac{4}{9}x^2 = 52$ $x^2 = 36$ $x = 6$ $\therefore R(6 ; 4) \text{ and } N(-6 ; 4)$ $\therefore NR = 12 \text{ units}$	✓ substitution ✓ simplification ✓ value of x ✓ length of NR (4)
4.4	Let $T(x ; 0)$ be the other x intercept of the small circle Then OT is the common chord $\therefore (x-2)^2 + (0+3)^2 = 13$ $(x-2)^2 = 13 - 9 = 4$ $x-2 = \pm 2$ $x = 2 \pm 2$ $x = 4 \text{ or } 0$ $\therefore \text{length of common chord} = OT = 4 \text{ units}$	$x^2 - 4x + 4 + 9 = 13$ $x^2 - 4x = 0$ $x(x-4) = 0$ $x = 0 \text{ or } x = 4$ (3) [17]

QUESTION/VRAAG 5

5.1.1	<p>Given : $\sin M = \frac{15}{17}$</p> <p>$MN^2 = 17^2 - 15^2$</p> <p>$= 64$</p> <p>$MN = 8$ OR</p> <p>$\therefore \tan M = \frac{15}{8}$</p>		<p>✓ sketch or Pyth</p> <p>✓ $MN = 8$</p> <p>✓ answer</p> <p>(3)</p>
5.1.2	<p>$\sin M = \frac{NP}{MP}$</p> <p>$\frac{NP}{51} = \frac{15a}{17a}$</p> <p>$\therefore NP = 45$</p>		<p>✓ equating trig ratios</p> <p>✓ answer</p> <p>(2)</p>
5.2	<p>$\cos(x - 360^\circ) \cdot \sin(90^\circ + x) + \cos^2(-x) - 1$</p> <p>$= \cos x \cdot \cos x + \cos^2 x - 1$</p> <p>$= \cos^2 x + \cos^2 x - 1$</p> <p>$= 2 \cos^2 x - 1$</p> <p>$= \cos 2x$</p>		<p>✓ $\cos x$ ✓ $\cos x$</p> <p>✓ $\cos^2 x$</p> <p>✓ identity</p> <p>(4)</p>
5.3.1	<p>$\sin(2x + 40^\circ) \cos(x + 30^\circ) - \cos(2x + 40^\circ) \sin(x + 30^\circ)$</p> <p>$= \sin[(2x + 40^\circ) - (x + 30^\circ)]$</p> <p>$= \sin(x + 10^\circ)$</p>		<p>✓ reduction</p> <p>✓ answer</p> <p>(2)</p>
5.3.2	<p>$\sin(2x + 40^\circ) \cos(x + 30^\circ) - \cos(2x + 40^\circ) \sin(x + 30^\circ) = \cos(2x - 20^\circ)$</p> <p>$\therefore \cos(2x - 20^\circ) = \sin(x + 10^\circ)$</p> <p>$\cos(2x - 20^\circ) = \cos[90^\circ - (x + 10^\circ)]$</p> <p>$2x - 20^\circ = 80^\circ - x + k.360^\circ$ or $2x - 20^\circ = 360^\circ - (80^\circ - x) + k.360^\circ$</p> <p>$3x = 100^\circ + k.360^\circ$ or $2x - 20^\circ = 280^\circ + x + k.360^\circ$</p> <p>$x = 33,33^\circ + k.120^\circ$ or $x = 300^\circ + k.360^\circ ; k \in \mathbb{Z}$</p> <p>OR/OF</p> <p>$\therefore \cos(2x - 20^\circ) = \sin(x + 10^\circ)$</p> <p>$\sin[90^\circ - (2x - 20^\circ)] = \sin(x + 10^\circ)$</p> <p>$110^\circ - 2x = x + 10^\circ + k.360^\circ$ or $110^\circ - 2x = 180^\circ - (x + 10^\circ) + k.360^\circ$</p> <p>$3x = 100^\circ - k.360^\circ$ or $110^\circ - 2x = 170^\circ - x + k.360^\circ$</p> <p>$x = 33,33^\circ - k.120^\circ$ or $x = -60^\circ - k.360^\circ ; k \in \mathbb{Z}$</p>	<p>✓ equating</p> <p>✓ co ratio</p> <p>✓ $80^\circ - x$ ✓ $280^\circ + x$</p> <p>✓ simplification/vereenv</p> <p>✓ $x = 33,33^\circ + k.120^\circ$</p> <p>✓ $x = 300^\circ + k.360^\circ ; k \in \mathbb{Z}$</p> <p>(7)</p> <p>✓ equating</p> <p>✓ co ratio</p> <p>✓ $x + 10^\circ$ ✓ $170^\circ - x$</p> <p>✓ simplification/vereenv</p> <p>✓ $x = 33,33^\circ - k.120^\circ$</p> <p>✓ $x = -60^\circ - k.360^\circ ; k \in \mathbb{Z}$</p> <p>(7)</p>	
			[18]

QUESTION/VRAAG 6

6.1	Period = 720°	✓ answer (1)
6.2	$y \in [-2 ; 2]$ OR/OF $-2 \leq y \leq 2$	✓✓ answer (2) ✓✓ answer (2)
6.3	$f(-120^\circ) - g(-120^\circ)$ $= -3 \sin\left(-\frac{120^\circ}{2}\right) - 2 \cos(-120^\circ - 60^\circ)$ $= \frac{4 + 3\sqrt{3}}{2}$ or 4,60 (4,5980...)	✓ $x = -120^\circ$ ✓ substitution ✓ answer (3)
6.4.1	x-intercepts of g at $-90^\circ + 60^\circ = -30^\circ$ and $90^\circ + 60^\circ = 150^\circ$ $\therefore x \in (-30^\circ ; 150^\circ)$ OR/OF x-intercepts of g at $-90^\circ + 60^\circ = -30^\circ$ and $90^\circ + 60^\circ = 150^\circ$ $-30^\circ < x < 150^\circ$	✓ value ✓ value ✓ answer (3) ✓ value ✓ value ✓ answer (3)
6.4.2	$x \in [-180^\circ ; -120^\circ) \cup (-30^\circ ; 60^\circ) \cup (150^\circ ; 180^\circ]$ OR/OF $-180^\circ \leq x < -120^\circ$ or $-30^\circ < x < 60^\circ$ or $150^\circ < x \leq 180^\circ$	✓ $[-180^\circ ; -120^\circ)$ ✓ $(-30^\circ ; 60^\circ)$ ✓ $(150^\circ ; 180^\circ]$ ✓ notation for inclusive in the first/last interval (4) ✓ $-180^\circ \leq x < -120^\circ$ ✓ $-30^\circ < x < 60^\circ$ ✓ $150^\circ < x \leq 180^\circ$ 1 mark: each interval ✓ notation for inclusive in the first/last interval (4)
		[13]

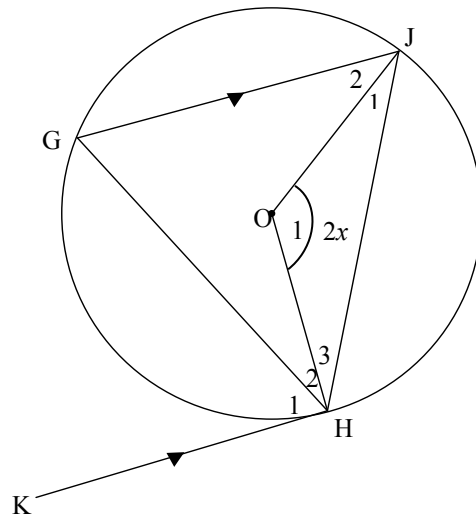
QUESTION/VRAAG 7

7.1	<p>In PMQ : $\tan \theta = \frac{x}{QM}$</p> <p>$\therefore QM = \frac{x}{\tan \theta}$</p> <p>OR/OF</p> <p>$\frac{x}{\sin \theta} = \frac{MQ}{\sin P}$</p> <p>$MQ = \frac{x \sin P}{\sin \theta}$</p> <p>$= \frac{x \cos \theta}{\sin \theta}$</p> <p>$= \frac{x}{\tan \theta}$</p>	<p>✓ trig ratio</p> <p>✓ answer (2)</p> <p>✓ sine rule</p> <p>✓ answer (2)</p>
7.2	<p>In PMR : $\tan \theta = \frac{x}{MR}$ OR PMQ \equiv PMR [AAS/HHS]</p> <p>$\therefore MR = \frac{x}{\tan \theta} = QM$</p> <p>$\hat{QMR} = 180^\circ - 2\beta$</p> <p>$\frac{\sin \beta}{MR} = \frac{\sin \hat{QMR}}{12x}$</p> <p>$\sin \beta \times \frac{\tan \theta}{x} = \frac{\sin(180^\circ - 2\beta)}{12x}$</p> <p>$\tan \theta = \frac{\sin 2\beta}{12x} \times \frac{x}{\sin \beta}$</p> <p>$\tan \theta = \frac{2 \sin \beta \cos \beta}{12x} \times \frac{x}{\sin \beta}$</p> <p>$\tan \theta = \frac{\cos \beta}{6}$</p> <p>OR</p>	<p>✓ MR = QM</p> <p>✓ correct substitution into the sine rule in ΔQMR</p> <p>✓ reduction</p> <p>✓ double angle (4)</p>

	<p>In PMR : $\tan \theta = \frac{x}{MR}$ OR $PMQ \equiv PMR$ [AAS/HHS]</p> $MR^2 = QM^2 + QR^2 - 2QM \cdot QR \cos \beta$ $MR^2 = \left(\frac{x}{\tan \theta}\right)^2 + (12x)^2 - 2\left(\frac{x}{\tan \theta}\right)(12x)(\cos \beta)$ $\frac{x^2}{\tan^2 \theta} = \frac{x^2}{\tan^2 \theta} + 144x^2 - 24\left(\frac{x^2}{\tan \theta}\right)(\cos \beta)$ $24\left(\frac{x^2}{\tan \theta}\right)(\cos \beta) = 144x^2$ $\cos \beta = 6 \tan \theta$ $\tan \theta = \frac{\cos \beta}{6}$	<p>✓ correct substitution into the cosine rule in ΔQMR</p> <p>✓ substitution</p> <p>✓ $MR = QM$</p> <p>✓ simplification</p> <p>(4)</p>
7.3	<p>$\frac{x}{QM} = \frac{\cos \beta}{6}$ [both equal $\tan \theta$]</p> $x = \frac{60 \cos 40}{6}$ <p>$x = 7,66$</p> <p>The height of the lighthouse is 8 metres</p>	<p>✓ equating</p> <p>✓ subst. $QM = 60$ and $\beta = 40^\circ$</p> <p>✓ answer</p> <p>(3)</p>
		[9]

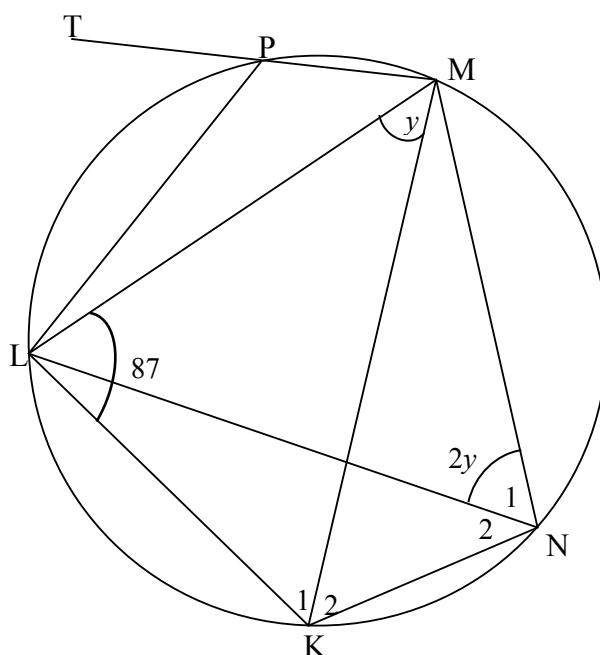
QUESTION/VRAAG 8

8.1



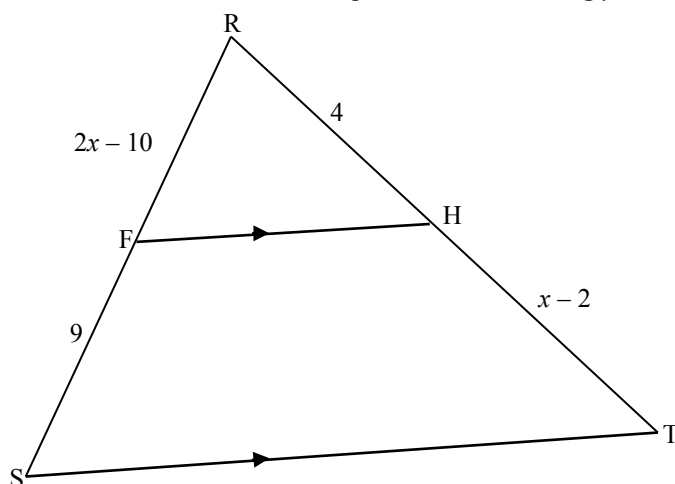
8.1.1	$\hat{G} = x$ [\angle centre = $2 \times$ circumference / <i>midpts</i> $\angle = 2 \times$ <i>omtreks</i> \angle] $\hat{H}_1 = x$ [alt \angle s / <i>verwiss</i> \angle e; $KH \parallel GJ$] $G\hat{J}H = x$ [tan chord theorem / <i>raaklyn koordstelling</i>]	\checkmark S \checkmark R \checkmark S \checkmark S \checkmark R
8.1.2	$\hat{J}_1 + \hat{H}_3 = 180^\circ - 2x$ [sum of \angle s in Δ / <i>som van</i> \angle e in Δ] $\therefore \hat{J}_1 = \hat{H}_3 = 90^\circ - x$ [\angle s opp equal sides / \angle e teenoor <i>gelyke sye</i>] $\therefore x + \hat{H}_2 = 90^\circ$ OR [tan \perp radius / <i>raaklyn</i> \perp <i>radius</i>] $\hat{H}_2 = 90^\circ - x$ $\therefore \hat{H}_2 = \hat{H}_3$	\checkmark S \checkmark S \checkmark R

8.2



8.2.1	$\hat{N}_2 = y$ [∠s in the same seg / ∠e in dieselfde segment]	✓S ✓R (2)
8.2.2(a)	$2y + y + 87^\circ = 180^\circ$ [opp ∠s of cyclic quad / teenoorst ∠e v kvh] $3y = 93^\circ$ $y = 31^\circ$	✓S ✓R ✓S (3)
8.2.2(b)	$\hat{P}L = 62^\circ$ [ext. ∠ of cyclic quad / buite ∠ v kvh]	✓S ✓R (2)
		[15]

9.2



9.2.1	$\frac{RF}{FS} = \frac{RH}{HT} \quad [\text{line} \parallel \text{one side of } \Delta \text{ OR prop theorem; FH} \parallel \text{ST}]$ <p>[Lyn een sy van $\Delta \text{ OF eweredigh. st; FH} \parallel \text{ST}]$</p> $\frac{2x-10}{9} = \frac{4}{x-2}$ $(2x-10)(x-2) = 4 \times 9$ $2x^2 - 14x - 16 = 0$ $x^2 - 7x - 8 = 0$ $(x-8)(x+1) = 0$ $\therefore x = 8 \quad (x \neq -1)$ <p>OR/OF</p> $\frac{RF}{RS} = \frac{RH}{RT} \quad [\text{line} \parallel \text{one side of } \Delta \text{ OR prop theorem; FH} \parallel \text{ST}]$ <p>[Lyn een sy van $\Delta \text{ OF eweredigh. st; FH} \parallel \text{ST}]$</p> $\frac{2x-10}{2x-1} = \frac{4}{x+2}$ $(2x-10)(x+2) = 4(2x-1)$ $2x^2 - 14x - 16 = 0$ $x^2 - 7x - 8 = 0$ $(x-8)(x+1) = 0$ $\therefore x = 8 \quad (x \neq -1)$	<p>✓ S/R</p> <p>✓ substitution</p> <p>✓ standard form</p> <p>✓ factors</p> <p>✓ answer with rejection</p> <p>(5)</p> <p>✓ S/R</p> <p>✓ substitution</p> <p>✓ standard form</p> <p>✓ factors</p> <p>✓ answer with rejection</p> <p>(5)</p>
9.2.2	$\frac{\text{area } \Delta RFH}{\text{area } \Delta RST} = \frac{\frac{1}{2} RF \times RH \sin \hat{R}}{\frac{1}{2} RS \times RT \sin \hat{R}}$ $= \frac{\frac{1}{2} \times 6 \times 4 \times \sin \hat{R}}{\frac{1}{2} \times 15 \times 10 \times \sin \hat{R}}$ $= \frac{24}{150} = \frac{4}{25}$	<p>✓ numerator/teller</p> <p>✓ denominator/noemer</p> <p>✓ substitution</p> <p>✓ answer</p> <p>(4)</p>
		[14]

	<p>OR/OF</p> <p>In $\triangle ODE$ and $\triangle ABE$</p> <ol style="list-style-type: none"> \widehat{E} is common $\widehat{DOE} = \widehat{EAB}$ (proved in 10.1.2) $\widehat{D_1} = \widehat{ABE}$ (\angle sum \triangle) <p>$\triangle ODE \parallel \triangle ABE$ ($\angle \angle \angle$)</p> $\frac{EO}{EA} = \frac{OD}{AB} = \frac{ED}{EB} \quad (\parallel \triangle s)$ <p>$\therefore AB \cdot EO = OD \cdot EA$ but $OE = FO$ (radii) $\therefore AB \times OF = OD \times EA$</p>	<p>✓ S</p> <p>✓ S</p> <p>✓ R</p> <p>✓ S</p> <p>✓ S</p> <p>✓ S ✓ R</p> <p>(7)</p>
10.2	$\frac{AT}{TO} = \frac{AC}{CD} = \frac{3}{1} \quad [\text{line } \parallel \text{ one side of } \triangle \text{ OR prop theorem; } FC \parallel OD]$ <p>But $CD = DE$</p> $\frac{AE}{CE} = \frac{5}{2} \quad \therefore AE = \frac{5}{2} CE$ $\frac{BE}{CE} = \frac{AE}{FE} \quad [\parallel \triangle s]$ $\frac{BE}{CE} = \frac{\frac{5}{2} CE}{FE}$ $BE \times FE = \frac{5}{2} CE^2$ $\therefore 5CE^2 = 2BE \cdot FE$	<p>✓ S ✓ R</p> <p>✓ S</p> <p>✓ S</p> <p>✓ substitute</p> $AE = \frac{5}{2} CE$ <p>(5)</p>
		[21]

TOTAL/TOTAAL: 150

MATHEMATICS P2: JUNE 2018 MARKING GUIDELINES NOTES

QUESTION 1

1.1.1	If left as 190, 25 then penalise 1 mark.
1.1.2	<p>If the position is used:</p> $\left[\frac{1}{4}(n+1) + \frac{3}{4}(n+1) \right] \div 2$ $= \frac{158 + 219}{2}$ $= \frac{377}{2}$ $= 188,5$

QUESTION 2

2.4	Do not accept estimation from the table.
-----	--

QUESTION 3

3.1	No ca if $\frac{x_2 - x_1}{y_2 - y_1}$	
3.3	$MD^2 + AM^2$ $= [(3-8)^2 + (-1+11)^2] + [(3-7)^2 + (-1-1)^2]$ $= 125 + 20$ $= 145$ AD^2 $= (7-8)^2 + (1+11)^2$ $= 145$ $MD^2 + AM^2 = AD^2$	$\checkmark \quad AM^2 + MD^2$ $\checkmark \quad AD^2$ $\checkmark \quad MD^2 + AM^2 = AD^2$ <div style="text-align: right;">(3)</div>

QUESTION 4

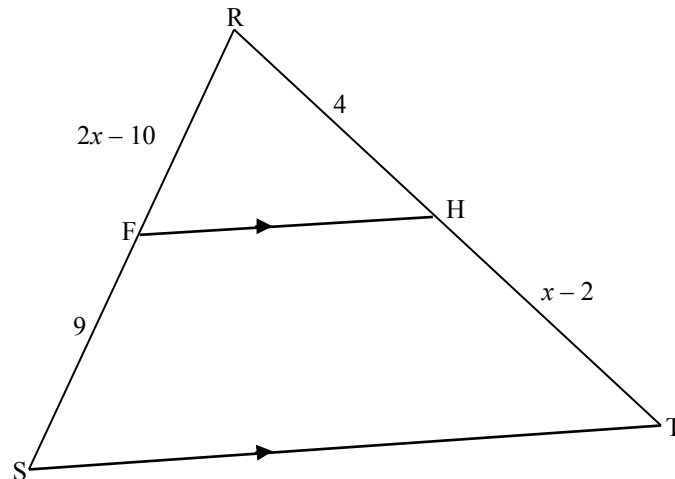
4.3	<p>Candidates can use the rotation of P through 90° to get to R(6 ; 4)</p> <p>If the candidate assumes that R(4 ; 6) : 1/4 marks</p>
-----	--

QUESTION 6

6.2	$y \in (-2 ; 2)$ 1/2 marks $-2 < y < 2$ 1/2 marks
-----	--

QUESTION 7

7.3	There is NO penalty for incorrect rounding.
-----	---

QUESTION 9

9.2.2

Join FT.

$$\text{area } \triangle RFH = \frac{4}{10} \times (\text{area } \triangle RFT)$$

$$\text{But area } \triangle RFT = \frac{6}{15} \times (\text{area } \triangle RST) \quad (\text{common vertex; = heights})$$

$$\text{area } \triangle RFH = \frac{4}{10} \times \frac{6}{15} \times (\text{area } \triangle RST)$$

$$\frac{\text{area } \triangle RFH}{\text{area } \triangle RST} = \frac{4}{25}$$