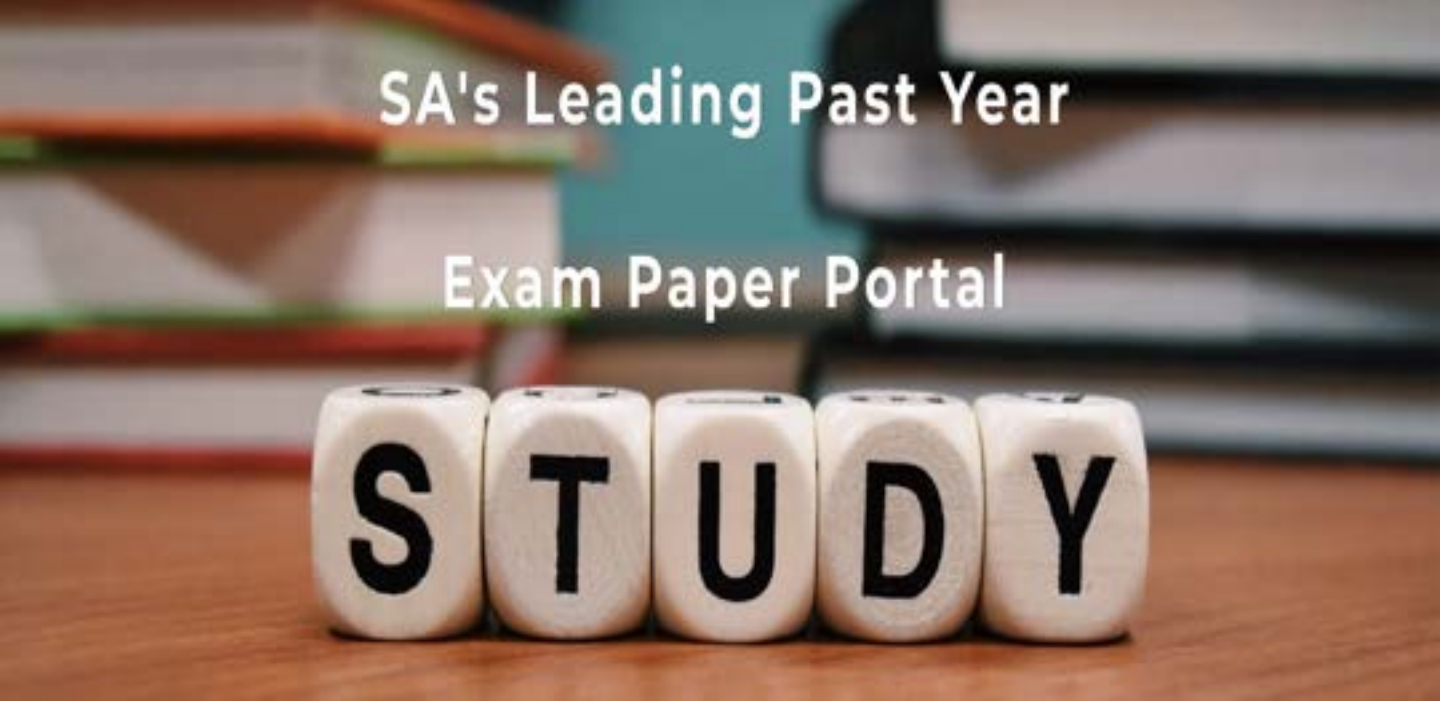

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Metro North Education District

Grade 12

Mathematics P2-MEMO
September 2019

MARKS: 150
TIME: 3 hours

NOTE:
• If a candidate answers a question TWICE, only mark the FIRST attempt.
• Consistent accuracy applies in ALL aspects of the marking guidelines.
Stop marking at the second calculation error.
• Assuming answers/values in order to solve a problem is NOT acceptable.

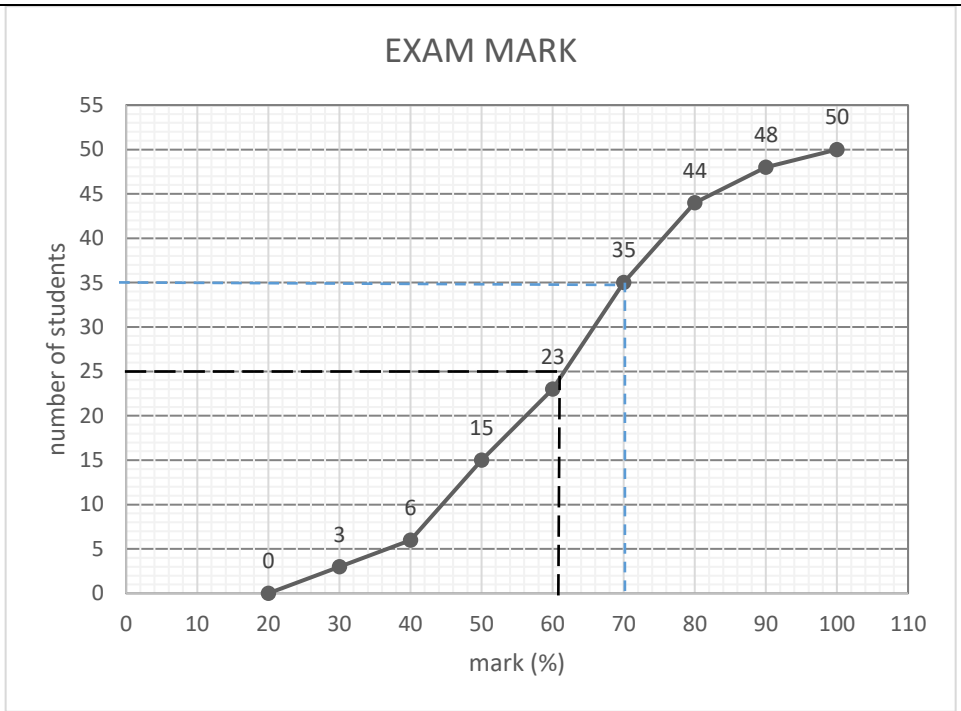
NOTA*:*
• As 'n kandidaat 'n vraag TWEE KEER beantwoord, merk slegs die EERSTE poging.
• Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyne toegepas.
Hou op nasien by die tweede berekeningsfout.
• Aanvaar van antwoorde/waardes om 'n probleem op te los, word NIE toegelaat nie.

GEOMETRY / MEETKUNDE:

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 'n 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 1

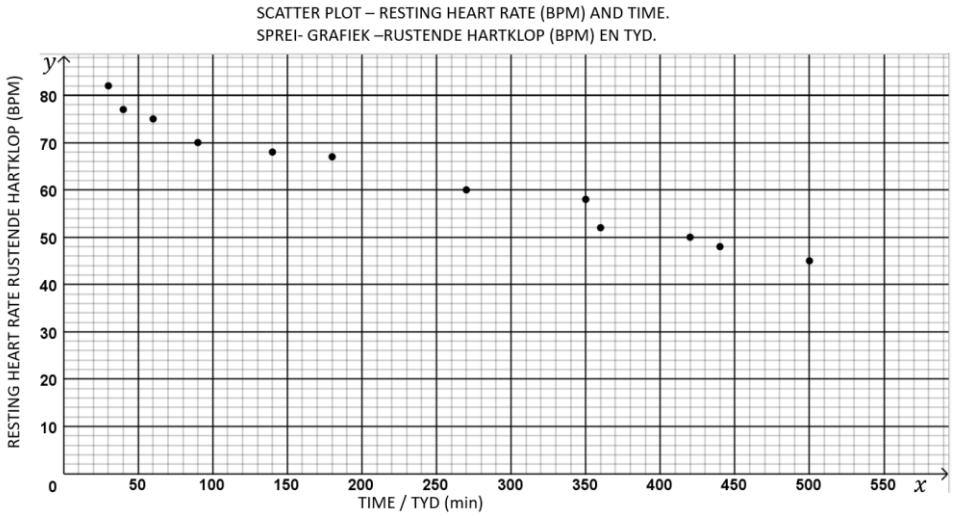
1.1



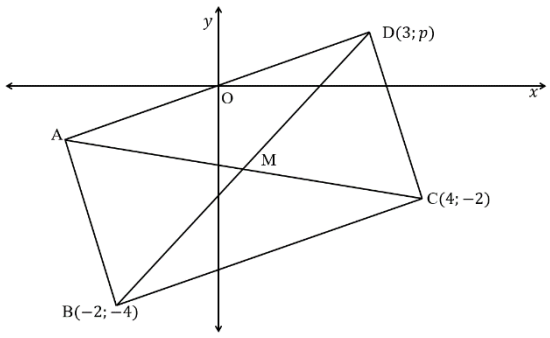
1.1.1	50	✓ *answer*	(1) K
1.1.2		✓ *first 4 values* ✓ *last 4 values*	(2) K
1.1.3	Median $= 62 \pm 1$	✓25 on graphs ✓ *answer* OR ✓✓Answer only	(2) R
1.1.4	$60 \leq x < 70$	✓ *answer*	(1) K
1.1.5	$50 - 35 = 15$ *learners*	✓ 35 on graph ✓ *answer* OR ✓✓Answer only	(2) R
1.2.1	$IQR = 20 - 11$ $= 9$	✓ 20-11 ✓ *answer* OR ✓✓Answer only	(2) K
1.2.2	2000 • the median score of 20 in 2000 is greater in value than the median score of 17 in 2010. • the upper half (50%)of the students in 2000 scored in the same score range as the upper one-fourth (25%) of the students in 2010. By considering the upper quarter, upper half, and upper three-quarters instead of just the lowest and highest scores, we would conclude that the students as a whole did much better in 2000 than in 2010.	✓ 2000 ✓ *reason*	(2) P
			[12]

Interval	Frequency	Cumulative frequency
$20 \leq x < 30$	3	3
$30 \leq x < 40$	3	6
$40 \leq x < 50$	9	15
$50 \leq x < 60$	8	23
$60 \leq x < 70$	12	35
$70 \leq x < 80$	9	44
$80 \leq x < 90$	4	48
$90 \leq x < 100$	2	50

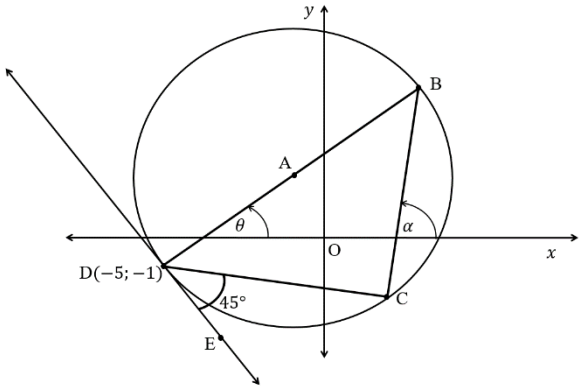
QUESTION 2

2.1		✓ 4 *values* ✓ 4 *values* ✓ 4 *values* (3) K	
2.2	$r = -0{,}98$	✓✓ *answer* -1 rouding	(2) R
2.3	$a = 79{,}71$ $b = -0{,}07$ $\hat{y} = 79{,}71 - 0{,}07x$	✓ *value of a* ✓ *value of b* ✓ *equation*	(3) R
2.4	$65 = 79{,}71 - 0{,}07x$ $-14{,}71 = -0{,}07x$ $210{,}14 \ldots min. = x$ 207,14 $\therefore$ 3,5 *hours per week* 3,45 h or 3h 27 min	✓ *subst* **CA from 2.3** ✓ 210,14 *min* ✓ 3,5 *hours*	(3) R
			[11]

QUESTION 3

			
3.1	AC=BD $\sqrt{50} = \sqrt{(3-(-2))^2 + (p-(-4))^2}$ $50 = 25 + p^2 + 8p + 16$ $p^2 + 8p - 9 = 0$ $(p+9)(p-1) = 0$ $p \neq -9\,; p = 1$	✓ *subst into correct formula* ✓ $p^2 + 8p - 9$ ✓ *factors* ✓ *correct p value*	(4) C
3.2	M $\left(\frac{3-2}{2}; \frac{1-4}{2}\right)$ M $\left(\frac{1}{2}; -\frac{3}{2}\right)$	✓ *subst into correct formula* ✓ $\frac{1}{2}$ ✓$\frac{-3}{2}$ OR ✓✓Answer only	(3) R
3.3	$m_{DC} = \frac{1-(-2)}{3-4}$ $m_{DC} = \frac{3}{-1}$ $m_{DC} = -3$	✓ *subst into correct formula* ✓-3 OR ✓✓Answer only	(2) K
3.4	$y = -3x + c$ $-4 = -3(-2) + c$ $-10 = c$ $y = -3x - 10$	✓$m = -3$ **CA** from 3.3 ✓$c = -10$	(2) R
			[11]

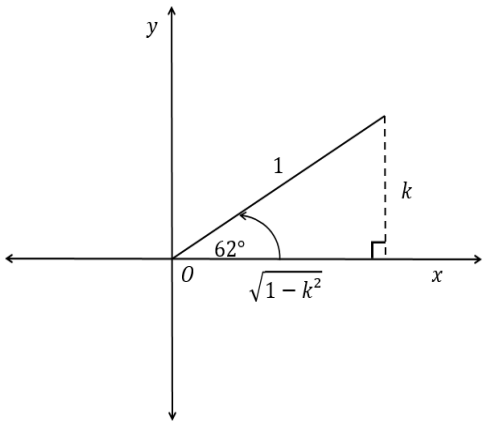
QUESTION 4



4.1.1	$A(-1;2)$	✓ -1 ✓ 2 A	(2) K
4.1.2	$\frac{x+(-5)}{2} = -1$ $x-5 = -2$ $x = 3$ $\frac{y+(-1)}{2} = 2$ $y-1 = 4$ $y = 5$ $B(3;5)$	✓ *both subst into mpt* ✓ $x = 3$ ✓ $y = 5$ **CA from 4.1.1** OR ✓✓Answer only	(3) C
4.1.3	$m_{AD} = \frac{2-(-1)}{-1-(-5)}$ $= \frac{3}{4}$	✓ *subst.* **CA from 4.1.1** ✓ *gradient*	(2) K
4.1.4	$tan\theta = \frac{3}{4}$ $\theta = 36{,}87°$	✓ $tan\theta = \frac{3}{4}$ **CA from 4.1.3** ✓ *answer* **CA**	(2) R
4.1.5	$m_{radius} = \frac{3}{4}$ $m_{tangent} = \frac{-4}{3}$ $\quad radius \perp tangent$ $y = -\frac{4}{3}x + c$ $-1 = -\frac{4}{3}(-5) + c$ $-1 = \frac{20}{3} + c$ $c = -\frac{23}{3}$ $\therefore y = -\frac{4}{3}x - \frac{23}{3}$	✓ $\frac{-4}{3}$ **CA from 4.1.3** **penalise if not neg but CA further.** ✓ *subst* $(-5;-1)$ ✓ $c = -\frac{23}{3}$	(3) R

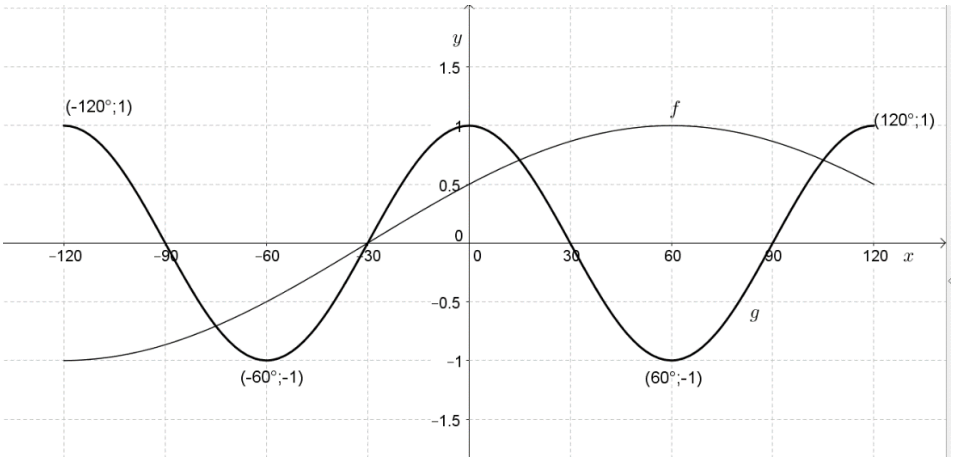
4.2	$\hat{B} = 45°$ [tan;chord theorem / raaklyn;koord stelling] $\alpha = 45° + 36{,}87°$ $[ext\angle of\ \Delta / buite\angle van \Delta]$ $\alpha = 81{,}87°$ $m_{BC} = \tan 81{,}87°$ $m_{BC} = 7$	✓ $\hat{B} = 45°$ ✓ α= 81,87° **CA from 4.1.4** ✓ $m_{BC} = \tan 81{,}87°$ ✓ $m_{BC} = 7$	(4) P
4.3.1	$x^2 - 6x + 9 + y^2 + 2y + 1 = 8 + 9 + 1$ $(x-3)^2 + (y+1)^2 = 18$ $\therefore$ M $(3; -1)$	✓ +9 both sides ✓ +1 both sides ✓ $(x-3)^2$ ✓ $(y+1)^2$ *answer given*	(4) R
4.3.2	M$(3; -1)$ and A $(-1; 2)$ MA $= \sqrt{(3-(-1))^2 + (-1-2)^2}$ $MA = \sqrt{16+9}$ $MA = \sqrt{25}$ $MA = 5$ $r_M + r_A = \sqrt{18} + 5$ or $= 9{,}24$ MA< $r_M + r_A$ $\therefore$ *circles intersect/sirkels sny*	✓ *subst* ✓5 ✓ $\sqrt{18} + 5$ ✓*reason for conclusion*	(4) P
			[24]

QUESTION 5

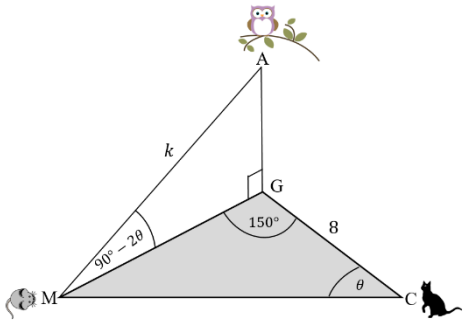
5.1	If $\sin40°.\cos22° + \cos40°.\sin22° = k$, then without the use of a calculator, determine the value of the following in terms of k.		
5.1.1	$\sin40°.\cos22° + \cos40°.\sin22° = k$ $\sin(40° + 22°)$ $\sin62° = k$	✓ $\sin(40° + 22°)$ ✓ *answer* A	(2) K
5.1.2	 $tan(118°)$ $= tan(180° - 62°)$ $= -tan62°$ $= -\frac{k}{\sqrt{1-k^2}}$	✓ $y = k\,; r = 1$ ✓ $x = \sqrt{1-k^2}$ ✓ $-tan62°$A ✓ *answer* **CA**	(4) R
5.1.3	$sin14.\ cos14°$ $= \frac{2sin14°cos14°}{2}$ $= \frac{1}{2}sin28°$ $= \frac{1}{2}cos62°$ $= \frac{\sqrt{1-k^2}}{2}$	✓$\frac{1}{2}sin28°$ ✓ $\frac{1}{2}cos62°$ (do not have to show give 2 marks for answer) ✓ *answer* **CA**	(3) C

5.2	$LHS = \frac{1 - cos2\theta}{sin2\theta \times tan\theta}$ $LHS = \frac{1 - (1 - 2sin^2\theta)}{2sin\theta cos\theta \times \frac{sin\theta}{cos\theta}}$ $LHS = \frac{2sin^2\theta}{2sin\theta \times \frac{sin\theta}{1}}$ $LHS = 1$ $LHS = RHS$	✓ $1 - 2sin^2\theta$ ✓ $2sin\theta cos\theta$ ✓ $\frac{sin\theta}{cos\theta}$ ✓ $\frac{sin^2\theta}{sin^2\theta}$	(4) C
5.3	$\sqrt{\sin(180° + A) . \cos(90° + A) - tan45}$ $= \sqrt{-\sin A . -sinA - 1}$ $= \sqrt{\sin A . sinA - 1}$ $= \sqrt{-(1 - \sin^2 A)}$ $= \sqrt{-cos^2 A}$ $\therefore cos^2 A = 0$ $A = 90° \pm 180°n \; ; n \in Z$ **OR** $A = 90° + 360n \quad or \; A = 270° + 360°n$	✓ $-\sin A$ ✓ $-\sin A$ ✓ -1 ✓$-cos^2 A$ ✓$cos^2 A = 0$ or $sin = 1$ or $cosA = 0$ ✓ $answer$	(6) C
			[19]

QUESTION 6

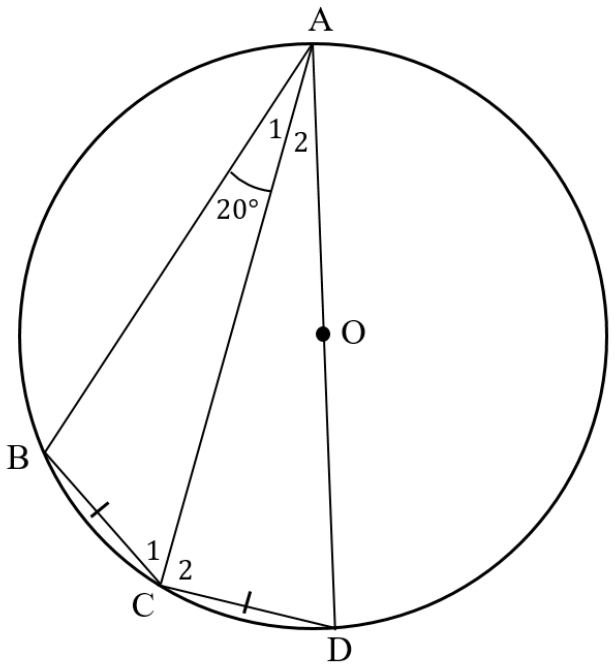
6.1	$f(x) = \sin(x + a)$		
			
6.1	$a = 30°$	✓ *answer*	(1) K
6.2	Sketch	✓ $x - intercepts$ ✓ $y - itercept$ ✓ *Turning points* ✓ *end points*	(4) R
6.3	$f(x) = g(x)$ $\sin(x + 30°) = \cos(3x)$ $\sin(x + 30°) = \sin(90° - 3x)$ $x + 30° = 90° - 3x \quad + 360°n \quad n \in Z$ $4x = 60° + 360°n$ $x = 15° + 90°n$ *or* $x + 30° = 180° - (90° - 3x) + 360°n$ $x + 30° = 90° + 3x + 360°n$ $-2x = 60° + 360°n$ $x = -30° - 180°n$	**CA from 6.1.1** ✓ $\sin(90° - 3x)$ ✓ *method in 1st quadrant* ✓ *answer* ✓ *method in 2nd quadrant* ✓ *answer*	(5) C
6.4	$15° < x < 105°$ or $x \in (15°; 105°)$	✓ *critical values* ✓ *notation* **CA from 6.3**	(2) C
6.1.5	$g(x) = \cos(3x)$ $k(x) = \cos(60° - 3x)$ $k(x) = \cos(3x - 60°)$ $k(x) = cos3(x - 20°)$ $\therefore$ *translated* $20°$ *to the right.* / *transleer* $20°$ *na regs*	✓✓ *answer* **A**	(2) P
			[14]

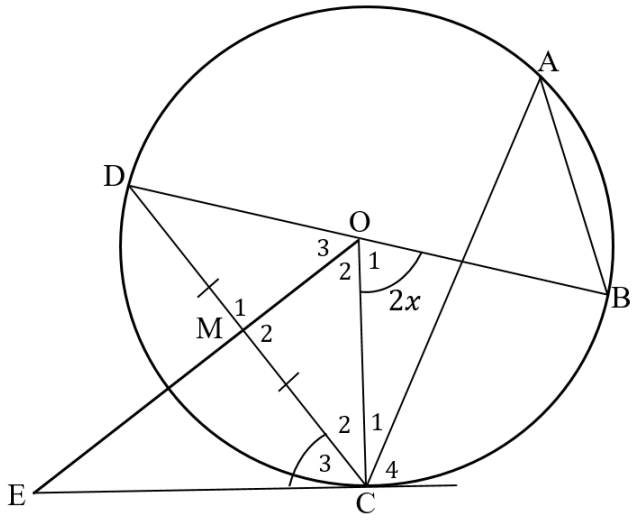
QUESTION 7



7.1	$M\hat{A}G = 2\theta$	✓ *answer*	(1) K
7.2	$\frac{MG}{sin2\theta} = \frac{k}{sin90°}$ $MG = \frac{ksin2\theta}{1}$ ... ... (1)	✓ $\frac{MG}{sin2\theta} = \frac{k}{sin90°}$ or $\frac{MG}{k} = sin2\theta$ ✓ $MG = \frac{ksin2\theta}{1}$	(2) C
7.3	$\frac{MC}{sin150°} = \frac{MG}{sin\theta}$ $\frac{MC}{½} = \frac{MG}{sin\theta}$ $MC = \frac{½MG}{sin\theta}$ ... ... (1) Subst. (2) in (1) $MC = \frac{ksin2\theta}{2sin\theta}$ $MC = \frac{k2sin\theta.cos\theta}{2sin\theta}$ $MC = kcos\theta$	✓ $\frac{MC}{sin150°} = \frac{MG}{sin\theta}$ ✓ ½ ✓ $MC = \frac{½MG}{sin\theta}$ ✓ $2sin\theta.cos\theta$ *answer given*	(4) C
7.4	$\Delta MGC = \frac{1}{2}MG.CG\ sin150°$ $\Delta MGC = \frac{1}{2}ksin2\theta.8\ \frac{1}{2}$ $\Delta MGC = 2ksin2\theta$ **OR** $\Delta MGC = \frac{1}{2}MC.CG\ sin\theta$ $\Delta MGC = \frac{1}{2}kcos\theta.8\ sin\theta$ $\Delta MGC = 4kcos\theta sin\theta$ $\Delta MGC = 2k(2cos\theta sin\theta)$ $\Delta MGC = 2ksin2\theta$	✓ *subst.* ✓ method *answer given* **OR** ✓ *subst.* ✓ method *answer given*	(2) C
			[9]

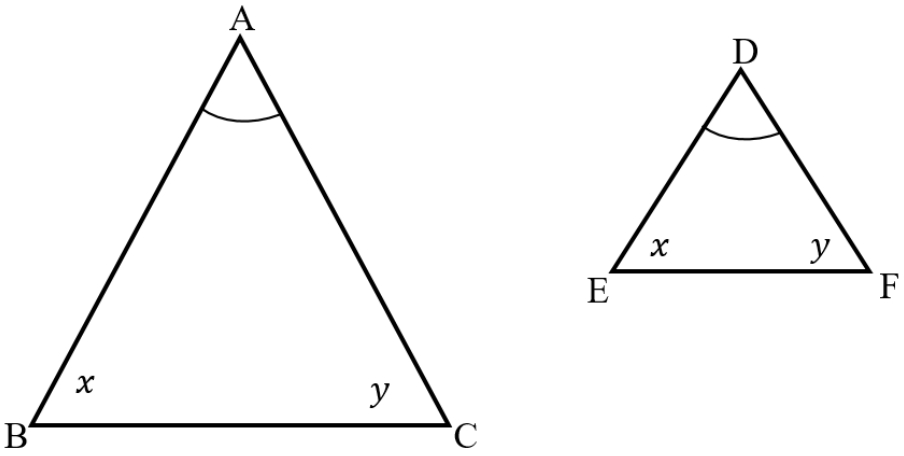
QUESTION 8

8.1			
8.1.1	$\widehat{A}_2 = 20°$ [equal chords; equal angles / *gelyke koorde; gelyke hoeke*]	✓ S ✓ R	(2) K
8.1.2	$\widehat{C}_2 = 90°$ [∠in semi-circle /∠ in semi-sirkel]	✓ S ✓ R	(2) K
8.1.3	$\widehat{D} = 70°$ [sum ∠s Δ/*som ∠e* Δ] $A\widehat{B}C = 110°$ [opp ∠ cyclic quad / *teenoorst.∠ v kvh*]	✓ S & R ✓ S ✓ R	(3) R

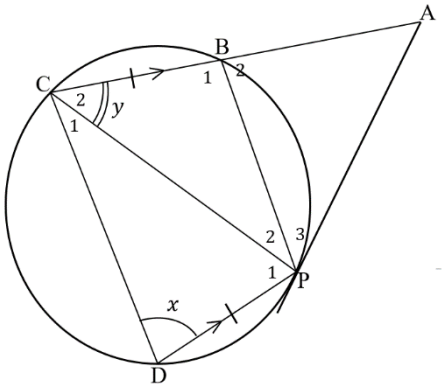
8.2			
8.2.1	$\hat{A} = x$ [∠ at centre = 2 ∠ at circumf/*midpts∠ = 2 omtreks∠*] $\widehat{D} = x$ [∠s in same segment/*∠e in dieselfde segment*] $\widehat{C_2} = x$ [∠s opp = radii/ *∠e teenoor = radiusse*]	✓ S ✓ R ✓ S ✓ R ✓ S ✓ R	(6) R
8.2.2	$\widehat{M_2} = 90°$ [Line from centre to midpoint of chord/ *lyn vanaf midpt na midpt van koord]* $\widehat{O_2} = 90° - x$ [sum ∠s Δ/*som ∠e* Δ]	✓ S ✓ R ✓ R	(3) C
8.2.3	$\widehat{O_2} = 90° - x$ [proven/ $reeds\ bewys$] $O\hat{C}E = 90°$ [radius ⊥ tangent/*raaklyn*] $\hat{E} = x$ [sum ∠s Δ/*som ∠e* Δ] $\therefore \hat{E} = \widehat{D} = x$ ∴ DOCE is a cyclic quadrilateral. [converse theorem: angles in the same segment] ∴ $DOCE\ is\ 'n\ kvh$ [$omgekeede\ stelling$: $hoeke\ in\ dies\ segment.$]	✓ S ✓ R ✓ S & R ✓ R	(4) C
			[20]

QUESTION 9

9.1

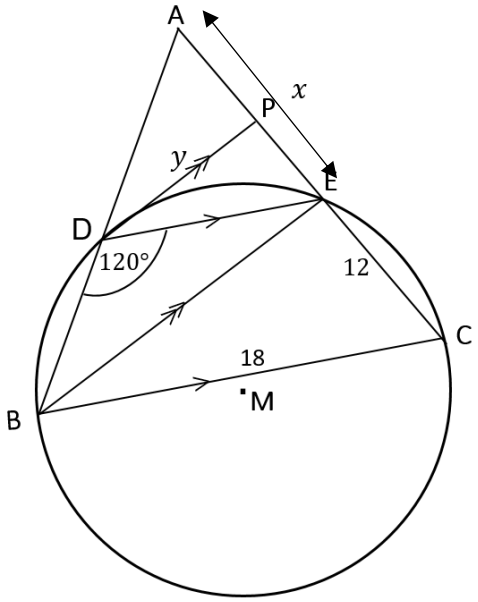


Constr: On sides AB and AC of ΔABC, mark points G and H respectively such that AG = DE and AH = DF. Draw GH/*Merk punt G en H op sy AB en AC van ΔABC onderskeidelik af sodanig dat AG = DE en AH = DF. Trek GH.*	✓ construction/ *konstruksie*
Proof/*Bewys*:	B/D if no construction
$\Delta AGH \equiv \Delta DEF$ [s, ∠, s]	✓ S/R
$\therefore A\hat{G}H = \hat{E}$	
$= \hat{B}$ [$\hat{B} = \hat{E}$, given/*gegee*]	✓ S
$\therefore GH \parallel BC$ [corresp/*ooreenk* $\angle^s$ =]	✓ S /R
$\therefore \frac{AG}{AB} = \frac{AH}{AC}$ [line ‖ one side of Δ] or [prop theorem; GH ‖ BC] [*lyn ‖ een sy van* Δ] *of* [*eweredighst*; GH ‖ BC]	✓ S ✓ R
$\therefore \frac{DE}{AB} = \frac{DF}{AC}$ [constr/*konstruksie*]	(6) K

9.2			
9.2.1	*In* ΔAPC and / en Δ ABP: 1) $\hat{A} = \hat{A}$ [common ∠ ; gemene ∠) 2) $\widehat{P_3} = \widehat{C_2} = y$ [tangent chord theorem/ *raaklyn koord stelling*] 3) $A\hat{P}C = \widehat{B_2}$ [sum ∠s Δ/*som ∠e* Δ] ∴ ΔAPC lll Δ ABP **OR** *In* ΔAPC and / en Δ ABP: 1) $\hat{A} = \hat{A}$ [common ∠ ; gemene ∠) 2) $\widehat{P_3} = \widehat{C_2} = y$ [tangent chord theorem/ *raaklyn koord stelling*] ∴ ΔAPC lll Δ ABP (∠; ∠; ∠)	✓ *S* & *R* ✓ *S* ✓ *R* ✓ *S* & *R* ✓ *S* & *R* ✓ *S* ✓ *R* ✓ *R* (∠; ∠; ∠)	
	OR		
	In ΔAPC and / en Δ ABP 1) $\hat{A} = \hat{A}$ [common ∠ ; gemene ∠) 2) $\widehat{B_2} = \widehat{D} = x$ [ext ∠ of cyc quad / buite ∠ koordevh.] $A\hat{P}C = \widehat{D} = x$ [tangent chord theorem/ *raaklyn koord stelling*] ∴ $A\hat{P}C = \widehat{B_2}$ 3) $\widehat{P_3} = \widehat{C_2}$ [sum ∠s Δ/*som ∠e* Δ] ∴ ΔAPC lll Δ ABP **OR** *In* ΔAPC and / en Δ ABP 1) $\hat{A} = \hat{A}$ [common ∠ ; gemene ∠) 2) $\widehat{B_2} = \widehat{D} = x$ [ext ∠ of cyc quad / buite ∠ koordevh.] $A\hat{P}C = \widehat{D} = x$ [tangent chord theorem/ *raaklyn koord stelling*] ∴ $A\hat{P}C = \widehat{B_2}$ ∴ ΔAPC lll Δ ABP (∠; ∠; ∠)	✓ *S* & *R* ✓ *S* & *R* ✓ *S* & *R* ✓ *S*&*R* ✓ *S* & *R* ✓ *S* & *R* ✓ *S* & *R* ✓ *R* (∠; ∠; ∠)	(4) R

9.2.2	$\frac{AP}{AB} = \frac{AC}{AP}$ ΔAPC lll Δ ABP ∴ AP² =AB.AC	✓ S	(1) K
9.2.3	In ΔAPC lll Δ CDP 1) $\widehat{P_1} = y$ [alt. ∠s/ verwis. ∠*e*; CB ‖ DP] 2) $\widehat{D} = C\widehat{P}A = x$ [tangent chord theorem/ *raaklyn koord stelling*] 3) $\hat{A} = \widehat{C_1}$ [sum ∠s Δ/*som ∠e* Δ] ∴ ΔAPC lll Δ CDP **OR** In ΔAPC lll Δ CDP 1) $\widehat{P_1} = y$ [alt. ∠s/ verwis. ∠*e*; CB ‖ DP] 2) $\widehat{D} = C\widehat{P}A = x$ [tangent chord theorem/ *raaklyn koord stelling*] ∴ ΔAPC lll Δ CDP (∠;∠;∠)	✓ S & R ✓ S ✓ R ✓ S & R ✓ S & R ✓ S ✓ R ✓ R (∠;∠;∠)	(4) R
9.2.4	$\frac{AC}{CP} = \frac{PC}{DP}$ [ΔAPC lll Δ CDP] ∴ PC² =DP.AC $AP^2 + PC^2 = AB.AC + AC.DP$ $= AC(AB + DP)$ $= AC(AB + BC)$ $[DP = BC]$ $= AC.AC$ $= AC^2$	✓ S ✓ S ✓ *common factor* ✓ $= AC(AB + \boldsymbol{BC})$ *answer given*	(4) P
			[19]

QUESTION 10



10.1.1	$\frac{AD}{DB} = \frac{AE}{EC}$ [line ‖ one side of Δ] or [prop theorem; DE ‖ BC] $[lyn \parallel een\ sy\ van\ \Delta]\ of\ \ [eweredighst;\ DE \parallel BC]$ $\frac{5}{4} = \frac{x}{12}$ $4x = 60$ $x = 15\ units$	✓ S ✓ R ✓ $answer$	(3) R
10.1.2	$\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{½AEh_B}{½ECh_B}$ [Same height B / $dieselfde\ hoogtepunt\ B$] $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{AE}{EC}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{15}{12}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{5}{4}$	✓ S ✓ $answer$ **CA from 10.1.1**	(2) R
	OR		
	$\hat{B} = 60°$ [co-interior ∠s DE ‖ BC] / $[ko - binne\ \angle e\ \ DE \parallel BC]$ $\hat{C} = 60°$ [opp. ∠s cyclic quad/ $teenoorst\ \angle e\ kdvh$] $\hat{A} = 60°$ [$\angle s$ of Δ ; $\angle e\ v.\Delta$] $\therefore AB = BC = AC = 27$		
	$\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{½AB.AE\ sin60°}{½EC.BC\ sin60°}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{27 \times 27}{12 \times 18}$ *or* $\frac{27 \times 27}{12 \times 27}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{27}{8}$ *or* $\frac{27}{12}$	✓ S ✓ $answer$	(2) R

10.2	$\hat{C} = 60°$ [opp. $\angle s$ cyclic quad/ *teenoorst* $\angle e$ *kdvh*]	✓ *S*	
	$BE^2 = 12^2 + 18^2 - 2(12)(18)cos60°$	✓ *Subst*	
	$BE^2 = 144 + 324 - 432(\frac{1}{2})$		
	$BE^2 = 252$		
	$BE = \sqrt{252}$	✓ $\sqrt{252}$	
	$BE = 6\sqrt{7}$		
	$\frac{AD}{AB} = \frac{DP}{BE}$ [ΔADP ||| ΔABE]	✓ *S* ✓ *R*	
	$\frac{5}{9} = \frac{y}{6\sqrt{7}}$		
	$9y = 5 \times 6\sqrt{7}$		
	$y = \frac{10\sqrt{7}}{3} or\ 8{,}82$	✓ *answer*	(6) P
	OR		
	$\hat{C} = 60°$ [opp. $\angle s$ cyclic quad/ *teenoorst* $\angle e$ *kdvh*]	✓ *S*	
	$BE^2 = 12^2 + 27^2 - 2(12)(27)cos60°$	✓ *Subst*	
	$BE^2 = 144 + 324 - 648(\frac{1}{2})$		
	$BE^2 = 792$		
	$BE = \sqrt{792}$	✓ $\sqrt{729}$	
	$BE = 6\sqrt{22}$		
	$\frac{AD}{AB} = \frac{DP}{BE}$ [ΔADP ||| ΔABE]	✓ *S* ✓ *R*	
	$\frac{5}{9} = \frac{y}{6\sqrt{22}}$		
	$9y = 5 \times 6\sqrt{22}$		
	$y = \frac{10\sqrt{22}}{3} or\ 15{,}63$	✓ *answer*	
			[11]

TOTAL: 150

QUESTIONS	MARK DISTRIBUTION(Sept 2019) PAPER 2(150 MARKS)							TOTAL	COGNITIVE LEVELS PAPER 2(150 MARKS)				TOTAL
	Statistics (20±3)	Analytical Geometry (40±3)	Trigonometry (40±3)	Euclidean Geometry and measurement (50±3)				150	Knowledge(20%)	Routine procedures(35%)	Complex procedures(30%)	Problem Solving(15%)	150
1	12							12	6	4		2	12
2	11							11	3	8			11
3		11						11	2	5	4		11
4		24						24	4	9	3	8	24
5			19					19	2	4	13		19
6			14					14	1	4	9		14
7			9					9	1		8		9
8				20				20	4	9	7		20
9				19				19	7	8		4	19
10				11				11		5		6	11
11								0					0
12								0					0
TOTAL	23	35	42	50		0	0	150	30	56	44	20	150
%	15	23	28	33		0	0	100	20	37	29	13	100

K	R	C	P
20%	**35%**	**30%**	**15%**
30	56	44	20
20%	37%	29%	13%

STAT	ANAL	TRIG	GEOMETRY
20 ±3	**40 ±3**	**40 ±3**	**50 ±3**
23	35	42	50

VRAESTEL 2: Graad 11 en 12: stellings en/of trigonometriese bewyse: maksimum 12 punte			
Beskrywing	**Graad 10**	**Graad 11**	**Graad 12**
Statistiek	15 ± 3	20 ± 3	20 ± 3
Analitiese Meetkunde	15 ± 3	30 ± 3	40 ± 3
Trigonometrie	40 ± 3	50 ± 3	40 ± 3
Euklidiese Meetkunde en Meting	30 ± 3	50 ± 3	50 ± 3
TOTAAL	**100**	**150**	**150**

QUESTION 10 ALTERNATIVE ANSWER

10.1.2	$\hat{B} = 60°$ [co-interior $\angle s$ DE || BC] / [$ko - binne\ \angle e\ DE \|\| BC$] $\hat{C} = 60°$ [opp. $\angle s$ cyclic quad/ $teenoorst\ \angle e\ kdvh$] $\hat{A} = 60°$ [$\angle s$ of Δ ; $\angle e\ v.\Delta$] $\therefore AB = BC = AC = 27$		
	$\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{½AB.AE\ sin60°}{½EC.BC\ sin60°}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{27 \times 27}{12 \times 18}$ *or* $\frac{27 \times 27}{12 \times 27}$ $\frac{\text{area of } \Delta \text{ AEB}}{\text{area of } \Delta \text{ ECB}} = \frac{27}{8}$ *or* $\frac{27}{12}$	✓ S ✓ *answer* **CA from (a)**	(2) R

10.2	$\hat{C} = 60°$ [opp. $\angle s$ cyclic quad/ $teenoorst\ \angle e\ kdvh$]	✓ S
	$BE^2 = 12^2 + 27^2 - 2(12)(27)cos60°$ $BE^2 = 144 + 324 - 648(\frac{1}{2})$ $BE^2 = 792$ $BE = \sqrt{792}$ $BE = 6\sqrt{22}$	✓ *Subst* ✓ $\sqrt{729}$
	$\frac{AD}{AB} = \frac{DP}{BE}$ [ΔADP ⫼ ΔABE]	✓ S ✓ R
	$\frac{5}{9} = \frac{y}{6\sqrt{22}}$ $9y = 5 \times 6\sqrt{22}$ $y = \frac{10\sqrt{22}}{3}\ or\ 15{,}63$	✓ *answer*