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NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 12

MATHEMATICS P2/*WISKUNDE V2*

SEPTEMBER 2025

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

These marking guidelines consist of 18 pages

Hierdie nasienriglyne bestaan uit 18 bladsye



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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 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, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek en nie oordoen nie, merk die doodgetrekte 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.*



QUESTION/VRAAG 1

AMOUNT/ BEDRAG (R)	FREQUENCY/ FREKWENSIE
$0 \leq x < 1000$	8
$1000 \leq x < 2000$	12
$2000 \leq x < 3000$	P
$3000 \leq x < 4000$	30
$4000 \leq x < 5000$	Q
$5000 \leq x < 6000$	12

1.1	20	✓ answer/antwoord (1)																					
1.2	$8 + 12 + P + 30 + Q + 12 = 100$ $P + Q = 38 \dots\dots\dots \textcircled{1}$ $\bar{x} = 3240 = \frac{8(500) + 12(1500) + P(2500) + 30(3500) + Q(4500) + 12(5500)}{100}$ $\therefore 1310 = 25P + 45Q$ $\therefore 262 = 5P + 9Q$ $5(38 - Q) + 9P = 262$ $190 - 5Q + 9Q = 262$ $4Q = 72$ $Q = 18$ $P = 20$	✓ $P + Q = 38$ ✓ eq of $\bar{x} = 3240$ ✓ $262 = 5P + 9Q$ ✓ subst/vervang $\textcircled{1}$ ✓ subst/vervang $Q = 18$ (5)																					
1.3	<table border="1"> <thead> <tr> <th>AMOUNT/ BEDRAG (R)</th><th>FREQUENCY/ FREKWENSIE</th><th>CUMULATIVE FREQUENCY/ KUMULATIEWE FREKWENSIE</th></tr> </thead> <tbody> <tr> <td>$0 \leq x \leq 1000$</td><td>8</td><td>8</td></tr> <tr> <td>$1000 \leq x \leq 2000$</td><td>12</td><td>20</td></tr> <tr> <td>$2000 \leq x \leq 3000$</td><td>20</td><td>40</td></tr> <tr> <td>$3000 \leq x \leq 4000$</td><td>30</td><td>70</td></tr> <tr> <td>$4000 \leq x \leq 5000$</td><td>18</td><td>88</td></tr> <tr> <td>$5000 \leq x \leq 6000$</td><td>12</td><td>100</td></tr> </tbody> </table>	AMOUNT/ BEDRAG (R)	FREQUENCY/ FREKWENSIE	CUMULATIVE FREQUENCY/ KUMULATIEWE FREKWENSIE	$0 \leq x \leq 1000$	8	8	$1000 \leq x \leq 2000$	12	20	$2000 \leq x \leq 3000$	20	40	$3000 \leq x \leq 4000$	30	70	$4000 \leq x \leq 5000$	18	88	$5000 \leq x \leq 6000$	12	100	✓ 8, 20, 40 ✓ 70, 88, 100 (2)
AMOUNT/ BEDRAG (R)	FREQUENCY/ FREKWENSIE	CUMULATIVE FREQUENCY/ KUMULATIEWE FREKWENSIE																					
$0 \leq x \leq 1000$	8	8																					
$1000 \leq x \leq 2000$	12	20																					
$2000 \leq x \leq 3000$	20	40																					
$3000 \leq x \leq 4000$	30	70																					
$4000 \leq x \leq 5000$	18	88																					
$5000 \leq x \leq 6000$	12	100																					

1.4	<i>Ogive/Ogief</i>	✓ min/max values ✓ all coordinates (penalise without grouning/penaliseer sonder beginpunt) ✓ Shape/Vorm (3)
1.5	$100 - 74 = 26$ members/lede • Possibility of an interval {73 - 75} CA from graph	✓ answer/antwoord (1)
[12]		

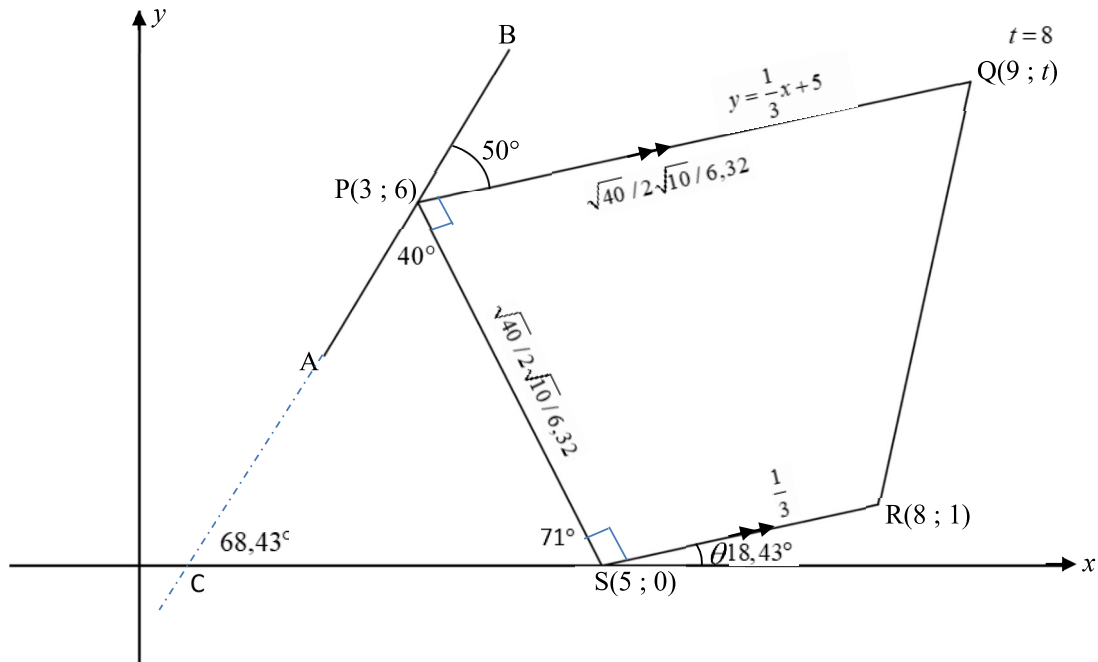
QUESTION/VRAAG 2

COUPLE/PAAR	1	2	3	4	5	6	7	8
JUDGE/BEOORDELAAR 1	18	4	6	8	5	12	10	14
JUDGE/BEOORDELAAR 2	15	6	3	5	5	14	8	15

2.1	$a = -0.03$ $b = 0,93$ $\hat{y} = -0.03 + 0,93x$	Answer only: full marks, but if a and b are swapped only 1/3 marks/ <i>Slegs antwoord: vol punte maar as a en b omgeruil is, slegs 1/3 punte.</i>	✓ a ✓ b ✓ equation/ vergelyking (3)
2.2	$\hat{y} = -0.03 + 0,93(15)$ $= 13,92$ OR / OF $13,85$ ≈ 14 CA from 2.1	Answer only: full marks <i>Slegs antwoord: vol punte</i>	✓ substitute 15 into eq. / vervang 15 in vgl. ✓ answer/antwoord (2)
2.3	Yes, they are consistent. $r = 0.9$ – positive strong correlation / <i>Ja, hulle is konsekwent. $r = 0.9$ – positief sterk korrelasie</i>		✓ yes/ja ✓ $r = 0,9$ ✓ positive strong/ positief sterk (3)

[8]

QUESTION/VRAAG 3



3.1	$m_{SR} = \frac{1-0}{8-5}$ $= \frac{1}{3}$	✓ subst./vervang ✓ answer/antwoord (2)
3.2	Equation/Vergelyking: PQ $m_{PQ} = m_{SR} = \frac{1}{3}$ $P(3; 6):$ $6 = \left(\frac{1}{3}\right)(3) + c$ CA from 3.1 only if gradient is + $\therefore c = 5$ $\therefore y = \frac{1}{3}x + 5$	✓ $m_{PQ} = m_{SR} = \frac{1}{3}$ ✓ subst. coordinates of/ vervang koördinate van P ✓ equation of PQ/ vergelyking van PQ (3)
3.3	$Q(9; t) \text{ in } y = \frac{1}{3}x + 5$ $t = \frac{1}{3}(9) + 5$ CA from 3.2 only if gradient is + $t = 8$	✓ subst. coordinates of/ vervang koördinate van P ✓ value of/ waarde van y (2)
3.4	$PQ = \sqrt{(3-9)^2 + (6-8)^2}$ $PQ = \sqrt{36+4}$ $PQ = \sqrt{40} / 2\sqrt{10} / 6.32$	✓ subst. coordinates in correct formula/ vervang koördinate in korrekte formule ✓ answer/antwoord

3.5	$m_{PS} = \frac{6-0}{3-5} = \frac{6}{-2} = -3$ $m_{SR} = \frac{1}{3}$ $m_{PS} \times m_{RS}$ $= -3 \times \frac{1}{3}$ $= -1$ $\therefore PS \perp SR$	$\checkmark m_{PS} = -3$ $m_{PS} \times m_{RS}$ $\checkmark = -3 \times \frac{1}{3}$ $= -1$ $\checkmark$ conclusion/gevolgtrekking (2)
3.6	$SR = \sqrt{(8-5)^2 + (1-0)^2}$ $SR = \sqrt{9+1}$ $SR = \sqrt{10} / 3,16$ $PS = \sqrt{(5-3)^2 + (0-6)^2}$ $PS = \sqrt{4+36}$ $PS = \sqrt{40} / 2\sqrt{10} / 6,32$ area of trapezium/ oppv van trapesium = $\frac{1}{2}(PQ + RS) \cdot PS$ $= \frac{1}{2}(\sqrt{40} + \sqrt{10}) \times \sqrt{40}$ $= 30 \text{ square units / vierkante eenhede}$	$\checkmark SR$ $\checkmark PS$ $\checkmark \text{ area of trapezium/ oppv van trapesium}$ $\checkmark \sqrt{40}$ $\checkmark \sqrt{10}$ $\checkmark \text{ answer/antwoord}$ (6)
Please note: Shoe-lace method is not in CAPS. Answer (ACC) only is 6/6		
3.7	$\tan \theta = \frac{1}{3}$ CA from 3.1 only if gradient is + $\therefore \theta = 18,43^\circ$ Answer only: full marks	$\checkmark \tan \alpha = m_{SR}$ $\checkmark \text{ answer/antwoord}$ (2)



4.1	A(-1;-1)	✓ answer/antwoord (1)
4.2	$\hat{ADC} = 90^\circ$ (line from centre bisect cord / <i>mdpt</i> $\square$; <i>mdpt koord</i>) FGC is a tangent to circle B / 'n raaklyn aan sirkel B $\therefore \hat{BCG} = 90^\circ$ (tan $\perp$ chord / <i>rklyn</i> $\perp$ <i>rad</i>) $m_{BC} = \frac{2-1}{3-4}$ $= -1$ $\therefore m_{AD} = -1$ CA only if BC gradient is - $\perp m_{FC} = 1$ $1 = 1(4) + c$ C(4;1): $c = -3$ $\therefore y = x - 3$	✓ $m_{BC} = -1$ ✓ $m_{FC} = 1$ ✓ equation of FC/ <i>vergelyking van FC</i> (4)
4.3	$\hat{ADF} = 90^\circ$ $FD^2 = 3^2 - \left(\frac{\sqrt{10}}{2}\right)^2$ (<i>pyth</i>) $FD^2 = 9 - \frac{10}{4}$ $FD = \sqrt{6\frac{1}{2}} = \frac{\sqrt{26}}{2} / 2,55$ FD = DG $\therefore FG = 2 \times \frac{\sqrt{26}}{2}$ $\therefore FG = \sqrt{26} / 5,10$	✓ radii ✓ subst. in pyth formula/ <i>vervang in pyth formule</i> ✓ $FD = \frac{\sqrt{26}}{2} / 2,55$ ✓ $FG = \sqrt{26} / 5,10$ (4)
4.4	$AB = \sqrt{(-1-3)^2 + (-1-2)^2}$ $AB = \sqrt{16+9}$ AB = 5 Answer only – full marks	✓ subst. coordinates in correct formula/ <i>vervang koördinate in</i> <i>korrekte formule</i> ✓ answer/antwoord (2)
4.5	BK = AB – AK BK = 5 – 3 BK = 2 $(x-3)^2 + (y-2)^2 = 4$ Answer only – full marks	✓ BK = 2 ✓ subst. coordinates in correct formula/ <i>vervang koördinate in</i> <i>korrekte formule</i> ✓ $r^2 = 4$ (3)
		[14]



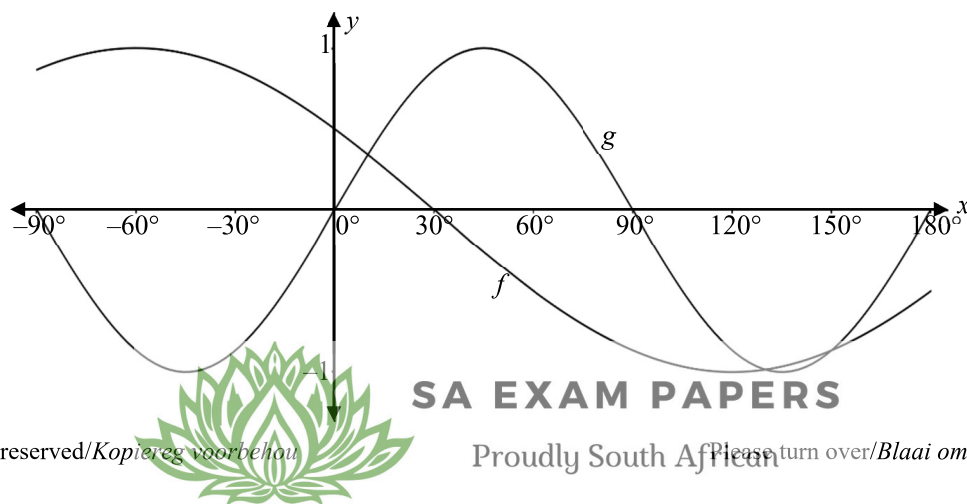
QUESTION/VRAAG 5

5.1.1	$\sin^2(180^\circ + \theta)$ $= \sin^2 \theta$ $= \left(\frac{-5}{\sqrt{41}} \right)^2$ $= \frac{25}{41}$	$OP^2 = OK^2 + KP^2$ $OP^2 = 4^2 + (-5)^2$ $OP = \sqrt{41}$	✓ $r = \sqrt{41}$ ✓ $\sin^2 \theta$ ✓ subst./vervang ✓ answer/antwoord (4)
5.1.2	$\tan(-\theta)$ $= -\tan \theta$ $= -\left(\frac{-5}{4} \right)$ $= \frac{5}{4}$		✓ $-\tan \theta$ ✓ answer/antwoord (2)
5.2.1	$\cos 15^\circ$ $= \cos(60^\circ - 45^\circ)$ $= \cos 60^\circ \cdot \cos 45^\circ + \sin 60^\circ \cdot \sin 45^\circ$ $= \frac{1}{2} \cdot \frac{1}{\sqrt{2}} + \frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{2}}$ $= \frac{1+\sqrt{3}}{2\sqrt{2}} / \frac{\sqrt{6}+\sqrt{2}}{4}$	Accept $\frac{\sqrt{2}}{2}$ ANSWER ONLY – NO MARKS DECIMAL ANSWERS – NO MARKS	✓ expansion ✓ $\frac{1}{2}$ ✓ $\frac{1}{\sqrt{2}}$ ✓ $\frac{\sqrt{3}}{2}$ ✓ $\frac{1}{\sqrt{2}}$ ✓ answer/antwoord (6)
5.2.2	$\frac{\cos(90^\circ + x) \cdot \cos(180^\circ - x)}{\cos^2(180^\circ + x) \cdot \tan(180^\circ - x)}$ $= \frac{(-\sin x)(-\cos x)}{(\cos^2 x)(-\tan x)}$ $= -\frac{\tan x}{\tan x}$ -1		✓ $-\sin x$ ✓ $-\cos x$ ✓ $\cos^2 x$ ✓ $-\tan x$ ✓ -1 (5)



5.3.1	$\frac{\sin 2\theta + 2\cos\theta - 2\cos^3\theta}{1 + \sin\theta} = \sin 2\theta$ $LHS = \frac{2\sin\theta\cos\theta + 2\cos\theta - 2\cos^3\theta}{1 + \sin\theta}$ $= \frac{2\sin\theta\cos\theta + 2\cos\theta(1 - \cos^2\theta)}{1 + \sin\theta}$ $= \frac{2\sin\theta\cos\theta + 2\cos\theta(\sin^2\theta)}{1 + \sin\theta}$ $= \frac{2\sin\theta\cos\theta(1 + \sin\theta)}{1 + \sin\theta}$ $= 2\sin\theta\cos\theta$ $= \sin 2\theta$ $= RHS$	✓ $2\sin\theta\cos\theta$ ✓ $2\cos\theta$ (common factor/gem faktor) ✓ $\sin^2\theta$ ✓ $2\sin\theta\cos\theta$ (common factor/gem faktor) ✓ $2\sin\theta\cos\theta$ (5)
5.3.2	$1 + \sin\theta = 0$ $\therefore \sin\theta = -1$ $\theta = -90^\circ \text{ or } \theta = 270^\circ$ Answer only – full marks	✓ $1 + \sin\theta = 0$ ✓ $-90^\circ, 270^\circ$ (both/beide) (2)
5.4	$\frac{4}{2 + \cos x}$ $= \frac{4}{2 + (-1)}$ $= \frac{4}{1}$ $= 4$ For max value, $\cos x$ should be a min/ <i>Vir maks waarde, moet $\cos x$ 'n min wees</i> Answer only – full marks	✓ -1 ✓ answer/antwoord (2)
		[26]

QUESTION/VRAAG 6



6.1	$\cos(x + 60^\circ) = \sin 2x$ $\therefore \cos(x + 60^\circ) = \cos[90^\circ - 2x]$ reference/verwysings $\angle : x + 60^\circ = 90^\circ - 2x$ 1: $x + 60^\circ = 90^\circ - 2x + k.360^\circ \quad k \in \mathbb{Z}$ $3x = 30^\circ + k.360^\circ$ $\therefore x = 10^\circ + k.120^\circ$ $x + 60^\circ = 360^\circ - (90^\circ - 2x) + k.360^\circ \quad k \in \mathbb{Z}$ $\therefore x + 60^\circ = 360^\circ - 90^\circ + 2x + k.360^\circ$ 4: $-x = 210^\circ + k.360^\circ$ $\therefore x = -210^\circ + k.360^\circ$ But/maar $x \in [-90^\circ ; 180^\circ]$ $\therefore x = 10^\circ; 130^\circ; 150^\circ$ OR/OF $\sin[90^\circ \pm (x + 60^\circ)] = \sin 2x$ 1: $90^\circ - x - 60^\circ = 2x + k.360^\circ \quad k \in \mathbb{Z}$ $-3x = -30^\circ + k.360^\circ$ $x = 10^\circ + k.120^\circ$ or / of 2: $90^\circ + x + 60^\circ = 2x + k.360^\circ \quad k \in \mathbb{Z}$ $-x = -150^\circ + k.360^\circ$ $x = 150^\circ - k.360^\circ$ But/maar $x \in [-90^\circ ; 180^\circ]$ $\therefore x = 10^\circ; 130^\circ; 150^\circ$	$\checkmark \cos(x + 60^\circ) = \cos[90^\circ - 2x]$ $\checkmark x + 60^\circ = 90^\circ - 2x + k.360^\circ$ $\checkmark x = 10^\circ + k.120^\circ$ $\checkmark$ $x + 60^\circ = 360^\circ - (90^\circ - 2x) + k.360^\circ$ $\checkmark x = -210^\circ + k.360^\circ$ $\checkmark k \in \mathbb{Z}$ (provided $k.360^\circ$ is stated/slegs as $k.360^\circ$ gegee word) $\checkmark$ all three answers/al drie antwoorde $\checkmark \sin[90^\circ \pm (x + 60^\circ)] = \sin 2x$ $\checkmark 90^\circ - x - 60^\circ = 2x + k.360^\circ$ $\checkmark -3x = -30^\circ + k.360^\circ$ $\checkmark 90^\circ + x + 60^\circ = 2x + k.360^\circ$ $\checkmark -x = -150^\circ + k.360^\circ$ $\checkmark k \in \mathbb{Z}$ $\checkmark$ all three answers/al drie antwoorde (7)
6.2	180°	$\checkmark$ answer/antwoord (1)
6.3	$10^\circ \leq x \leq 130^\circ \cup 150^\circ \leq x < 180^\circ$ of $[10^\circ; 130^\circ] \cup [150^\circ; 180)$	$\checkmark$ values/waardes $\checkmark$ notation/notasie (2)
6.4	$p(x) = \sin(x - 30^\circ)$ The graph of h is shifted/moved 30° to the right./ Die grafiek het 30° na regs geskuif.	$\checkmark$ shifted/moved/geskuif $\checkmark 30^\circ$ $\checkmark$ right/regs (3)
		SA EXAM PAPERS [13]

QUESTION/VRAAG 7

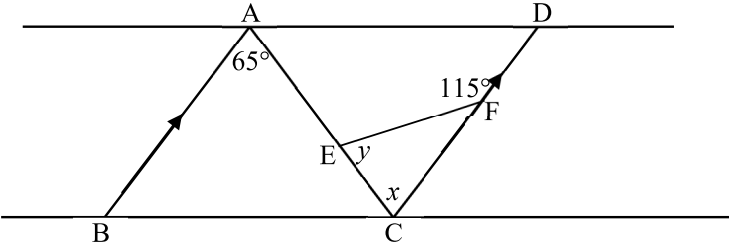
7.1	$A(b \cos A; b \sin A)$ $c^2 = AB^2 = (x_A - x_B)^2 + (y_A - y_B)^2$ $c^2 = (b \cos C - a)^2 + (b \sin C - 0)^2$ $c^2 = b^2 \cos^2 C - 2ab \cos C + a^2 + b^2 \sin^2 C$ $c^2 = b^2 (\cos^2 C + \sin^2 C) + a^2 - 2ab \cos C$ $c^2 = b^2 (1) + a^2 - 2ab \cos C$ $c^2 = a^2 + b^2 - 2ab \cos C$	✓ coordinates of/coördinate van A ✓ correct subst into distance/korrekte invervanging in afstands formulae ✓ simplification/vereenvoudig ✓ $\sin^2 x + \cos^2 x = 1$ (4)
7.2.1	$AC^2 = d^2 + \left(\frac{d}{2}\right)^2 - 2.d.\frac{d}{2}.\cos(90^\circ - \alpha)$ $AC^2 = d^2 + \frac{d^2}{4} - d^2 \sin \alpha$ $AC^2 = \frac{5d^2}{4} - \frac{4d^2 \sin \alpha}{4}$ $AC^2 = \frac{d^2 (5 - 4 \sin \alpha)}{4}$ $AC = \frac{d\sqrt{5 - 4 \sin \alpha}}{2}$ $\tan \theta = \frac{h}{AC}$ $\therefore h = AC \cdot \tan \theta$ $\therefore h = \frac{d\sqrt{5 - 4 \sin \alpha}}{2} \cdot \tan \theta$	✓ correct subst into cosine rule/korrekte vervanging in kosinus formule ✓ $BC = \frac{d}{2}$ ✓ $\sin \alpha$ ✓ factorise/faktoriseer (4)
7.2.2	$\tan \theta = \frac{h}{AC}$ $\therefore h = AC \cdot \tan \theta$ $\therefore h = \frac{300 \cdot \sqrt{5 - 4 \sin 32^\circ}}{2} \cdot \tan 63^\circ$ $\therefore h = 499,63m$	✓ trig ratio ✓ correct subst into tan ratio/korrekte vervanging in tan verhouding ✓ answer/antwoord (3)
		[11]



GEOMETRY/MEETKUNDE

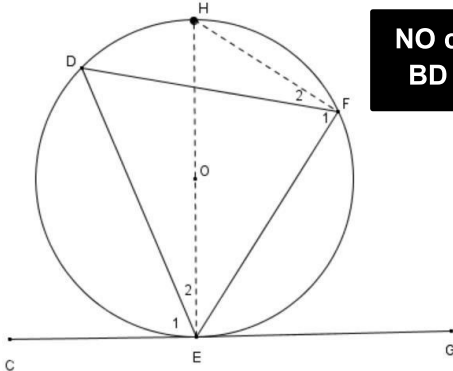
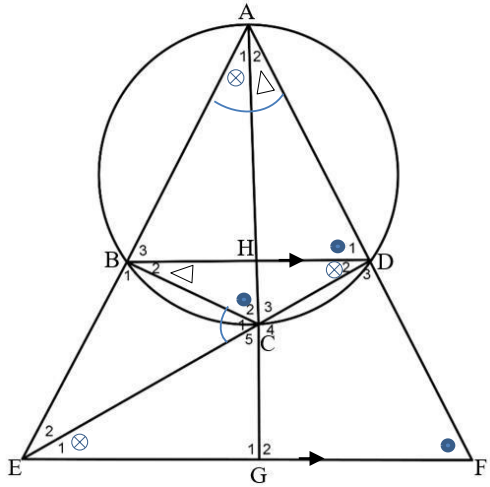
Please read carefully through the following table before marking **QUESTION 8–10** /

Lees asseblief sorgvuldig deur die volgende tabel alvorens **VRAE 8–10** nagesien word.

	The order in which the candidate answers a geometry question must follow logically/ <i>Die volgorde waarin 'n kandidaat 'n meetkundevraag beantwoord moet logies volg.</i> Example/Voorbeeld Given/Gegee $AB \parallel CD$ and/en $\hat{EFD} = 115^\circ$  The candidate first needs to calculate x BEFORE he/she can calculate y/Die kandidaat moet eerste vir x bereken VOORDAT hy/sy vir y kan bereken.
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 the 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 (Both MUST be correct to get one mark)
	Ken 'n punt toe as die bewering EN rede beide korrek is (Beide MOET korrek wees om een punt te kry)



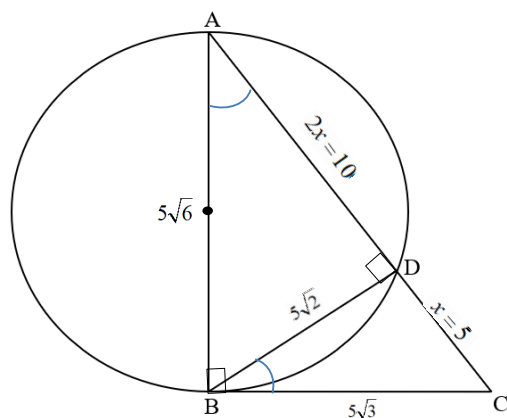
QUESTION/VRAAG 9

9.1	 Construction/konstruksie: Line EH through midpoint to circumference to F/Middel lyn EH en verbind met F $\hat{E}_1 + \hat{E}_2 = 90^\circ$ [rad $\perp$ tan/ rklyn] $\hat{F}_1 + \hat{F}_2 = 90^\circ$ [$\angle$ in semi circle./ $\angle$ in halfsirkel] $\hat{F}_1 + \hat{F}_2 = \hat{E}_1 + \hat{E}_2$ But/maar $\hat{E}_2 = \hat{F}_2$ [$\angle$ sin the same segment/ $\angle$ e in dieselfde sirkelsegment] $\therefore \hat{E}_1 = \hat{F}_1$ $\hat{C}\hat{E}\hat{D} = \hat{F}_1$	✓ constr/konstr ✓ S ✓ R ✓ S/R ✓ S/R (5)
		
9.2.1	$\hat{E}_1 = \hat{D}_2$ [alt $\angle$s / verw. $\angle$e; $BD \parallel EF$] $\hat{D}_2 = \hat{A}_1$ [$\angle$s in the same segment/ $\angle$ e in dieselfde sirkel segment] $\therefore \hat{E}_1 = \hat{A}_1$	✓ S/R (with //) ✓ S ✓ R (3)
9.2.2	$\therefore EF$ is a tangent/EF is 'n raaklyn [converse tan chord/ omgekeerde raaklyn koord stelling]	✓ R (1)

9.2.3	In $\triangle ABC$ and/en $\triangle EDF$ is: $\hat{A}_1 = \hat{E}_1$ [proved/bewys in 9.2.1] $\hat{B}_2 + \hat{B}_3 = \hat{D}_3$ [ext $\angle$ of cyclic quad / buite $\angle$ v kvh] $\hat{C}_2 = \hat{F}$ [3^{rd} $\angle$ sum of $\triangle$ / 3^{de} $\angle$ som $\angle$ v $\triangle$] $\therefore \triangle ABC \parallel \triangle EDF$ [$\angle, \angle, \angle$] OR/OF In $\triangle ABC$ and $\triangle DEF$: $\hat{A}_1 = \hat{E}_1$ [proven/ bewys in 9.2.1] $\hat{B}_2 + \hat{B}_3 = \hat{D}_3$ [ext $\angle$'s of cyclic quad / buite $\angle$ v vierhoek] $\therefore \triangle ABC \parallel \triangle EDF$ [$\angle, \angle, \angle$]	✓ S ✓ S ✓ R ✓ S/R ✓ S ✓ S ✓ R ✓ R (4)
9.2.4	$\frac{AB}{ED} = \frac{BC}{DF}$ [out of $\parallel$ / uit $\parallel$] penalize once if // lines not shown/ penaliseer 1x as // ontbreek $\therefore AB = \frac{BC \cdot ED}{DF}$ But/maar $\frac{AB}{BE} = \frac{AH}{HG}$ [$BH \parallel EG$] [line $\parallel$ to one side of a $\triangle$ / lyn $\parallel$ ander sy v $\triangle$] [prop theorem $BD \parallel EF$ / $BD \parallel EF$] $\therefore AB = \frac{AH \cdot BE}{HG}$ $\therefore \frac{AH \cdot BE}{HG} = \frac{BC \cdot ED}{DF}$	✓ S ✓ R ✓ S (making AB the subject/maak AB die onderwerp) ✓ S ✓ R ✓ S (making AB the subject/maak AB die onderwerp) (6)
		[19]



QUESTION/VRAAG 10



10.1	$\hat{A}DB = 90^\circ$ [$\angle$ in semi circle./ $\angle$ in halfsirkel] $\hat{A}BC = 90^\circ$ [rad $\perp$ tan/ <i>rklyn</i>] $AB^2 = (2x)^2 + BD^2$1 $BC^2 = (x)^2 + BD^2$2 $AB^2 + BC^2 = 5x^2 + 2BD^2$ $9x^2 = 5x^2 + 2BD^2$ $\therefore 4x^2 = 2BD^2$ $\therefore BD = \sqrt{2}x$ $\therefore \frac{BD}{DC} = \sqrt{2}$ OR/OF $BD^2 = AD \cdot CD$ [right angled Δ with $BD \perp AC$ / <i>loodlyn vanuit reghoekige hoekpunt</i>] $BD^2 = 2x \cdot x$ $\therefore BD = \sqrt{2}x$ $\frac{BD}{DC} = \frac{\sqrt{2}x}{x} = \sqrt{2}$	$\checkmark$ both 90° S/R $\checkmark$ both eq $\checkmark 4x^2 = 2BD^2$ $\checkmark BD = \sqrt{2}x$ $\checkmark$ S $\checkmark$ R $\checkmark BD = \sqrt{2}x$ (4)
------	--	--



10.2	$AB^2 = 10.15$ $AB = 5\sqrt{6}$ $BC^2 = 5.15$ $BC = 5\sqrt{3}$ $AB + BC + AC$ $= 5\sqrt{6} + 5\sqrt{3} + 15$ $= 35,91$	✓ $AB = 5\sqrt{6}$ ✓ $BC = 5\sqrt{3}$ ✓ answer/ <i>antwoord</i> (3)
		[7]

TOTAL/TOTAAL: 150