NASIONALE SENIOR SERTIFIKAAT-EKSAMEN
MEI 2024

WISKUNDE: VRAESTEL II

NASIENRIGLYNE

Tyd: 3 uur 150 punte

Hierdie nasienriglyne is opgestel vir gebruik deur eksaminators en hulpeksaminators van wie verwag word om almal 'n standaardiseringsvergadering by te woon om te verseker dat die riglyne konsekwent vertolk en toegepas word by die nasien van kandidate se skrifte.

Die IEB sal geen bespreking of korrespondensie oor enige nasienriglyne voer nie. Ons erken dat daar verskillende standpunte oor sommige aangeleenthede van beklemtoning of detail in die riglyne kan wees. Ons erken ook dat daar sonder die voordeel van die bywoning van 'n standaardiseringsvergadering verskillende vertolkings van die toepassing van die nasienriglyne kan wees.

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LET WEL:

- Indien 'n kandidaat 'n vraag meer as een keer beantwoord, sien slegs die EERSTE poging na.
- Deurlopende akkuraatheid is op alle aspekte van die nasienmemorandum van toepassing.

AFDELING A

VRAAG 1

(a)(1)	<table><tr><td>Ouderdom</td><td>22</td><td>24</td><td>27</td><td>30</td><td>35</td><td>39</td><td>43</td><td>45</td></tr><tr><td>spm</td><td>180</td><td>150</td><td>120</td><td>180</td><td>110</td><td>90</td><td>110</td><td>200</td></tr></table> $y = 171{,}983 - 0{,}890x$	✓Gebruik van korrekte waardes uit grafiek ✓171,983 ✓0,890
(a)(2)	$y = 171{,}983 - 0{,}890(50)$ $y \approx 127{,}5$ spm	✓ $y = 171{,}983 - 0{,}890(50)$ ✓ $y \approx 127{,}5$ spm
(a)(3)	Ekstrapolasie – 50 is buite die gegewe bestek Daar is 'n swak korrelasie van –0,2	✓Ekstrapolasie – 50 is buite ✓swak korrelasie van –0,2
(b)(1)	$60 \times 25\%$ $\therefore 15$ leerders	✓ $\therefore 15$ leerders
(b)(2)	$Q_1 - 1{,}5 \times \text{IKV}$ $= 27 - 1{,}5 \times 6$ $= 18$ Dit is nie 'n uitskieter nie, aangesien $24 > 18$	✓ $= 18$ ✓Nie 'n uitskieter nie
(b)(3)	Geen effek op die mediaan nie	✓ Geen effek nie

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VRAAG 2

(a)	$m_{BC} = \frac{2}{3}$ BC || AO $y = \frac{2}{3}x + c$ ... vervang $(-3;6)$ $c = 8$ $\therefore y = \frac{2}{3}x + 8$ **Alternatief:** $m_{BC} = \frac{2}{3}$ BC || AO $y - 6 = \frac{2}{3}(x + 3)$ $\therefore y = \frac{2}{3}x + 8$	✓ $m_{BC} = \frac{2}{3}$ ✓ $y = \frac{2}{3}x + c$ ✓ $c = 8$ $\therefore y = \frac{2}{3}x + 8$
(b)	Vervang $x = -3$ in $y = \frac{2}{3}x$ $y = -2$ $A(-3;-2)$	✓ $x = -3$ ✓ $x = -3$ in $y = \frac{2}{3}x$ ✓ $y = -2$ $A(-3;-2)$
(c)	$m_{AB} = m_{OC}$ || lyne $m_{OC} = \frac{0-6}{0+3}$ $\therefore m_{OC} = -2$ $y = -2x + c$ ... vervang $(-3;-2)$ $c = -8$ $\therefore y = -2x - 8$ **Alternatief:** $m_{AB} = m_{OC}$ || lyne $m_{OC} = \frac{0-6}{0+3}$ $\therefore m_{OC} = -2$ $y + 2 = -2(x + 3)$ $\therefore y = -2x - 8$	✓ $m_{OC} = -2$ ✓ $y = -2x + c$ ✓ $c = -8$ $y = -2x - 8$

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(d)	Snypunt van BC en AB: $\frac{2}{3}x+8=-2x-8$ $x=-6$ $\therefore y=4$ $B(-6;4)$ **Alternatief:** Deur simmetrie: skuif punt C – 3 eenhede links en 2 eenhede af. $B(-6;4)$	✓$\frac{2}{3}x+8=-2x-8$ ✓ $x=-6$ ✓$\therefore y=-2(-6)-8$ ✓$\therefore y=4$

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VRAAG 3

(a)	$\hat{B} = 90°$ … hoek in halfsirkel $\therefore x = 114°$ …buitehoek van driehoek	✓$\hat{B} = 90°$ ✓ hoek in halfsirkel ✓$\therefore x = 114°$
(b)	$\hat{D}_1 = 24°$ … hoeke in dieselfde segment	✓$\hat{D}_1 = 24°$ ✓ hoeke in dieselfde segment
(c)	$C\hat{E}B = 2 \times 24°$ … hoek by middelpunt = 2X $= 48°$	✓ $C\hat{E}B = 2 \times 24°$ $= 48°$ ✓ hoek by middelpunt = 2X

VRAAG 4

(a)	Konstruksie: AF deur middelpunt O. Verbind BF. $D\hat{A}F = 90°$ … raaklyn loodreg op radius $\therefore B\hat{A}F = 90° - x$ $A\hat{B}F = 90°$ … hoek in halfsirkel $\therefore$ In ΔABF: $\hat{F} = x$ … binnehoeke van driehoek $\therefore \hat{C} = y = x$ … hoeke in dieselfde segment AB **Alternatief:** Konstruksie: AF deur middelpunt O. Verbind CF. $D\hat{A}F = 90°$ … raaklyn loodreg op radius $\therefore B\hat{A}F = 90° - x = B\hat{C}F$ … hoeke in dieselfde segment Maar $A\hat{C}F = 90°$ … hoek in halfsirkel Dus $x = y$	✓ AF deur middelpunt O. Verbind BF. ✓ $D\hat{A}F = 90°$ … raaklyn loodreg op radius ✓ $\therefore B\hat{A}F = 90° - x$ ✓ $A\hat{B}F = 90°$ … hoek in halfsirkel ✓ ΔABF: $\hat{F} = x$ ✓ $\therefore \hat{C} = y = x$ … hoeke in dieselfde segment AB
(b)(1)	$O\hat{B}C = 90°$ … raaklyn loodreg op radius $\therefore \hat{B}_1 = 90° - 38°$ $= 52°$ $\therefore \hat{A} = 52°$ … radii/hoeke teenoor gelyke sye	✓ $O\hat{B}C = 90°$ raaklyn loodreg op radius ✓ $\therefore \hat{B}_1 = 52°$ ✓ $\therefore \hat{A} = 52°$ radii/hoeke teenoor gelyke sye
(b)(2)	$\therefore \hat{O}_3 = 180° - (2 \times 52°)$ … binnehoeke van driehoek $= 76°$ $\therefore \hat{O}_1 = 76°$ … gelyke koorde onderspan gelyke hoeke	✓ $\therefore \hat{O}_3 = 76°$ ✓ $\therefore \hat{O}_3 = 76°$ ✓ gelyke koorde onderspan gelyke hoeke

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VRAAG 5

(a)	$D\hat{E}B = E\hat{B}C$ … verwisselende hoeke DE//BC $E\hat{D}C = D\hat{C}B$ … verwisselende hoeke DE//BC $B\hat{T}C = D\hat{T}E$ … Regoorstaande hoeke $\therefore \Delta DET /// \Delta CBT$ … (HHH)	✓ $D\hat{E}B = E\hat{B}C$ … verwisselende hoeke DE//BC ✓ $E\hat{D}C = D\hat{C}B$ … verwisselende hoeke DE//BC ✓$\therefore \Delta DET /// \Delta CBT$ … (HHH)
(b)	$\frac{DE}{BC} = \frac{DT}{CT}$ … /// driehoeke; sye eweredig $\frac{8}{BC} = \frac{4}{7}$ $BC = 14$ $\frac{ET}{BT} = \frac{DT}{CT}$ $\frac{6}{BT} = \frac{4}{7}$ $BT = 10\frac{1}{2}$ $\therefore BC + BT = 24\frac{1}{2}$	✓ $\frac{DE}{BC} = \frac{DT}{CT}$ … /// driehoeke; sye eweredig ✓ $\frac{8}{BC} = \frac{4}{7}$ ✓ $BC = 14$ ✓ $\frac{6}{BT} = \frac{4}{7}$ $BT = 10\frac{1}{2}$ ✓ $\therefore BC + BT = 24\frac{1}{2}$
(c)	$\Delta ADE /// \Delta ABC$ … gelykhoekig $\therefore \frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$ $\therefore \frac{AD}{AB} = \frac{8}{14} = \frac{AE}{AC}$ $\therefore \frac{AD}{AB} = \frac{AE}{AC} = \frac{4}{7}$ … lyn // een sy van driehoek $\therefore AD : DB = 4 : 3$	✓$\Delta ADE /// \Delta ABC$ … gelykhoekig ✓$\therefore \frac{AD}{AB} = \frac{8}{14} = \frac{AE}{AC}$ ✓$\therefore AD : DB = 4 : 3$

VRAAG 6

(a)	$\frac{(\sin\theta)(\cos\theta)(-\tan\theta)}{(\sin 2\theta)(\tan\theta)}$ $=\frac{(\sin\theta)(\cos\theta)(-\tan\theta)}{(2\sin\theta\cos\theta)(\tan\theta)}$ $=-\frac{1}{2}$	✓ $\sin\theta$ ✓ $\cos\theta$ ✓ $-\tan\theta$ ✓ $\sin 2\theta$ ✓ $\tan\theta$ ✓ $2\sin\theta\cos\theta$ ✓ $=-\frac{1}{2}$
(b)(1)	$\sin 2(17°)$ $=2\sin 17°.\cos 17°$ $=2k$	✓ $=2\sin 17°.\cos 17°$ ✓ $=2k$
(b)(2)	$-\left(1-2\sin^2 17°\right)$ $=-\cos 2(17°)$ $=-\cos 34°$ $\sin 34°=\frac{2k}{1}=\frac{y}{r}$ $x=\sqrt{1-4k^2}$ … Pythagoras $\therefore -\cos 34°=-\sqrt{1-4k^2}$	$-\left(1-2\sin^2 17°\right)$ $=-\cos 2(17°)$ ✓ $=-\cos 34°$ ✓✓ $x=\sqrt{1-4k^2}$ ✓ $\therefore -\cos 34°=-\sqrt{1-4k^2}$
(c)(1)	$x^2=3^2-2^2$ … Pythagoras $x=-\sqrt{5}$ $\tan(-A)$ $=-\tan A$ $=\frac{2}{\sqrt{5}}$	✓ $x^2=3^2-2^2$ ✓ $x=-\sqrt{5}$ ✓ $=-\tan A$ ✓ $=\frac{2}{\sqrt{5}}$
(c)(2)	$\sin A.\cos 30°+\cos A.\sin 30°$ $=\left(\frac{2}{3}\right)\left(\frac{\sqrt{3}}{2}\right)+\left(\frac{-\sqrt{5}}{3}\right)\left(\frac{1}{2}\right)$ $=\frac{2\sqrt{3}-\sqrt{5}}{6}$	✓ $\sin A.\cos 30°+\cos A.\sin 30°$ ✓ $\left(\frac{2}{3}\right)\left(\frac{\sqrt{3}}{2}\right)$ ✓ $\left(\frac{-\sqrt{5}}{3}\right)\left(\frac{1}{2}\right)$ ✓ $\frac{2\sqrt{3}-\sqrt{5}}{6}$

AFDELING B

VRAAG 7

(a)	$x^2-10x+y^2+14y=-49$ $(x-5)^2+(y+7)^2=25$ Sirkelmiddelpunt: (5; –7) T (2; –3) lê op die sirkel $m_{PT}=\frac{-3+7}{2-5}=-\frac{4}{3}$ $\therefore m=\frac{3}{4}$ Alternatief vir vergelyking van raaklyn: $y=\frac{3}{4}x+c$ Vervang: (2; –3) $\therefore c=-\frac{9}{2}$ $y=\frac{3}{4}x-\frac{9}{2}$ $\therefore 4y=3x-18$ $\therefore k=3$ en $t=-18$ Alternatief vir vergelyking van raaklyn: $y-3=\frac{3}{4}(x-2)$	✓✓ $(x-5)^2+(y+7)^2=25$ ✓ Sirkelmiddelpunt: $(5;-7)$ ✓ $m_{PT}=\frac{-3+7}{2-5}=-\frac{4}{3}$ ✓ $m_{\tan}=\frac{3}{4}$ ✓ $c=-\frac{9}{2}$ $y=\frac{3}{4}x-\frac{9}{2}$ $k=3$ ✓ $t=-18$
(b)	Vervang (7; 0) in vergelyking van tweede sirkel om r te bepaal. $(x-4)^2+(y-3)^2=r^2$ $(7-4)^2+(0-3)^2=r^2$ $r=\sqrt{18}$ Afstand tussen middelpunte: $\sqrt{(4-5)^2+(3+7)^2}$ $=\sqrt{101}$ ≈ 10 Som van radii = $5+\sqrt{18}$ $\approx 9{,}2$ Afstand tussen middelpunte > som van radii Dus sny die sirkels nie.	✓ $(7-4)^2+(0-3)^2=r^2$ ✓ $r=\sqrt{18}$ ✓ $=\sqrt{101}$ ✓ $5+\sqrt{18}$ ✓ Afstand tussen middelpunte > som van radii ✓ sny nie

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VRAAG 8

(a)	$\tan \hat{CAB} = 3$ $\therefore \hat{CAB} = 71{,}565°$ $\therefore \hat{CBA} = 71{,}565° \ldots \angle \text{ teenoor } = \text{ sye}$ $m_{DB} = \tan(180° - 71{,}565°)$ $= -3$ Vergelyking BD: $y = -3x + c$ Vervang $(6;3)$ $\therefore c = 21$ $\therefore y = -3x + 21$	✓$\tan C\hat{A}B = 3$ ✓$C\hat{B}A = 71{,}565°$ ✓$m_{DB} = \tan(180° - 71{,}565°)$ ✓$= -3$ $y = -3x + c$ ✓ $\therefore c = 21$ $\therefore y = -3x + 21$
(b)	Vir koördinate van A: $m_{AC} = 3 = \frac{3-0}{6-x}$ $\therefore x = 5$ A$(5;0)$ en D$(0;21)$ Vir middelpunt van sirkel: Middelpunt DA$\left(\frac{5}{2};\frac{21}{2}\right)$ Vergelyking van sirkel: $\left(x-\frac{5}{2}\right)^2 + \left(y-\frac{21}{2}\right)^2 = r^2$ Vervang $(5;0)$ $\therefore r^2 = 116{,}5$ $\left(x-\frac{5}{2}\right)^2 + \left(y-\frac{21}{2}\right)^2 = 116{,}5$	✓$x = 5$ ✓Middelpunt DA$\left(\frac{5}{2};\frac{21}{2}\right)$ ✓$\left(x-\frac{5}{2}\right)^2 + \left(y-\frac{21}{2}\right)^2 = r^2$ ✓Vervang $(5;0)$ ✓$\therefore r^2 = 116{,}5$ ✓$\left(x-\frac{5}{2}\right)^2 + \left(y-\frac{21}{2}\right)^2 = 116{,}5$

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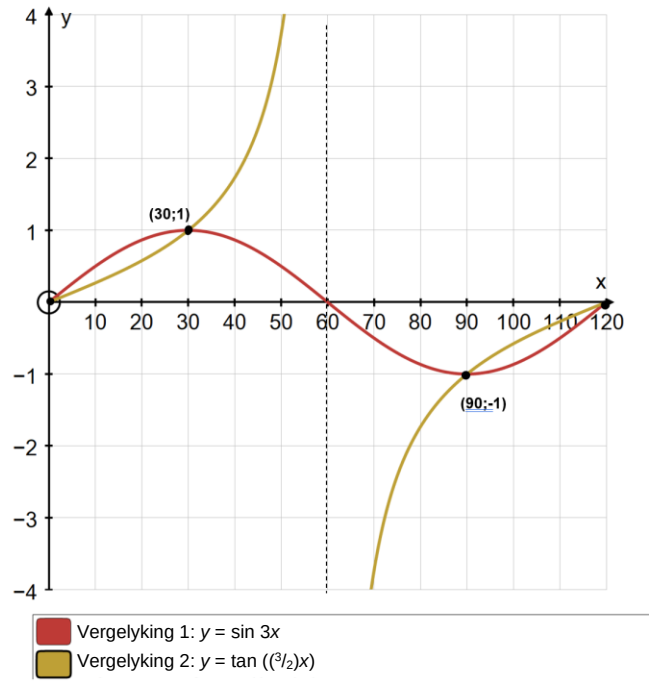
VRAAG 9

(a)	$\sin 2\left(\frac{3}{2}\right)x = \frac{\sin\frac{3}{2}x}{\cos\frac{3}{2}x}$	✓ $\sin 2\left(\frac{3}{2}\right)x = \frac{\sin\frac{3}{2}x}{\cos\frac{3}{2}x}$
	$2\sin\frac{3}{2}x.\cos\frac{3}{2}x = \frac{\sin\frac{3}{2}x}{\cos\frac{3}{2}x}$	✓ $2\sin\frac{3}{2}x.\cos\frac{3}{2}x$
	$2\sin\frac{3}{2}x.\cos\frac{3}{2}x - \sin\frac{3}{2}x = 0$ $\therefore \sin\frac{3}{2}x\left(2\cos^2\frac{3}{2}x - 1\right) = 0$	✓ $\therefore \sin\frac{3}{2}x\left(2\cos^2\frac{3}{2}x - 1\right) = 0$
	$\therefore \sin\frac{3}{2}x(2\cos 3x) = 0$	✓ $(\cos 3x)$
	$\therefore \sin\frac{3}{2}x = 0$ of $\cos 3x = 0$ $\frac{3}{2}x = 180°k \quad \therefore x = 120°k$ of $3x = \pm 90° + 360°k$ $\therefore x = \pm 30° + 120°k$ $\therefore x = 120°k$ of $x = 30° + 60°k; k \in Z$	✓ $\frac{3}{2}x = 360°k$ of $\frac{3}{2}x = 180° + 360°k$ ✓ $x = 240°k$ ✓ of $x = 120°k + 240°k$ ✓ $\therefore x = \pm 30° + 120°k$
	Alternatief: $\sin 3x = \tan\frac{3}{2}x$ Laat $\frac{3}{2}x = p$ $\sin 2p = \tan p$ $\sin 2p = \frac{\sin p}{\cos p}$ $2\sin p\cos^2 p = \sin p$ $\sin p\left(2\cos^2 p - 1\right) = 0$ $\sin p(\cos 2p) = 0$ $\sin p = 0$ of $\cos 2p = 0$ $\sin p = 0$ $\therefore p = 180°k$ $\therefore \frac{3}{2}x = 180°k$ $\therefore x = 120°k$ of $\cos 2p = 0$ $\therefore 2p = 90° + 180°k$ $\therefore 3x = 90° + 180°k$ $\therefore x = 30° + 60°k$ $\therefore x = 120°k$ of $x = 30° + 60°k; k \in Z$	✓ $\sin 2p = \frac{\sin p}{\cos p}$ ✓ $2\sin p\cos^2 p = \sin p$ ✓ $\sin p\left(2\cos^2 p - 1\right) = 0$ ✓ $\sin p = 0$ ✓ $x = 120°k$ ✓ of $\cos 2p = 0$ ✓ $\therefore 3x = 90° + 180°k$ ✓ $\therefore x = 30° + 60°k$

	Alternatief: $\sin 3x = \tan\frac{3}{2}x$ Laat $\frac{3}{2x} = p$ $\sin 2p = \tan p$ $\sin 2p = \frac{\sin p}{\cos p}$ $2\sin p\cos^2 p = \sin p$ $\sin p\left(2\cos^2 p - 1\right) = 0$ $\sin p = 0$ of $2\cos^2 p - 1 = 0$ $\sin p = 0$ $\therefore p = 180°k$ $\therefore \frac{3}{2}x = 180°k$ $\therefore x = 120°k$ of $2\cos^2 p - 1 = 0$ $\therefore \cos^2 p = \frac{1}{2}$ $\cos p = \pm\sqrt{\frac{1}{2}}$ $\therefore \frac{3}{2}x = 45° + 90°k$ $\therefore x = 30° + 60°k \quad k \in Z$ $\therefore x = 120°k$ of $x = 30° + 60°k; k \in Z$	✓ $\sin 2p = \frac{\sin p}{\cos p}$ ✓ $2\sin p\cos^2 p = \sin p$ ✓ $\sin p\left(2\cos^2 p - 1\right) = 0$ ✓ $\sin p = 0$ ✓ $x = 120°k$ ✓ $\cos p = \pm\sqrt{\frac{1}{2}}$ ✓ $p = 45° + 90°k$ ✓ $\therefore \frac{3}{2}x = 45° + 90°k$ ✓ $\therefore x = 30° + 60°k$

(b)		Grafiek van *f*: ✓Afsnitte ✓amplitude ✓periode Grafiek van *g*: ✓asimptoot ✓afsnitte ✓snydings
(c)	$\{0° \le x \le 30°\} \cup \{60° < x \le 90°\}$	✓$\{0° \le x \le 30°\}$ ✓$\{60° < x \le 90°\}$

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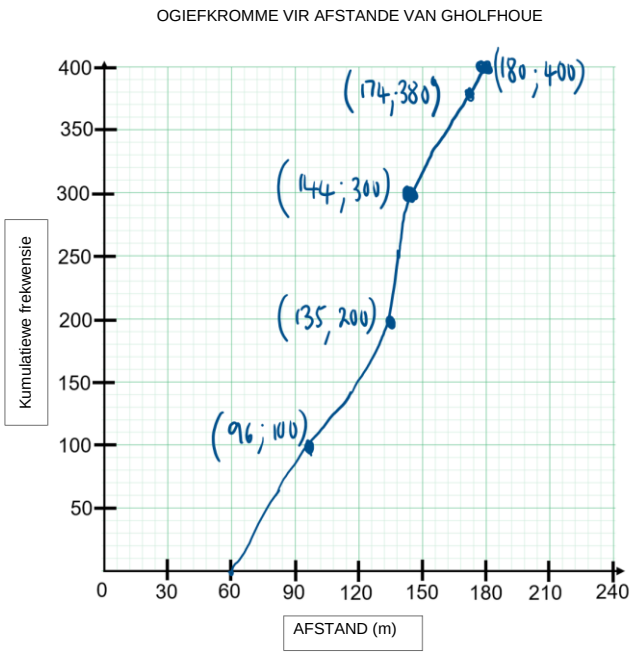
VRAAG 10

(a)	$2\cos^2\theta - 1 + 3(2\sin\theta.\cos\theta) = -1$ $2\cos^2\theta - 1 + 6\sin\theta.\cos\theta + 1 = 0$ $2\cos\theta(\cos\theta + 3\sin\theta) = 0$ $\cos\theta + 3\sin\theta = 0$ $\tan\theta = -\frac{1}{3}$ $\therefore \theta = -18{,}4° + 180°k \;\; ; \;\; k \in Z$ $\therefore \theta = \{-18{,}4°; -198{,}4°\}$	✓ $2\cos^2\theta - 1$ ✓ $2\sin\theta\cos\theta$ ✓ $\cos\theta + 3\sin\theta = 0$ ✓ $\tan\theta = -\frac{1}{3}$ ✓ $\theta = -18{,}4° + 180°k$ ✓✓ $\theta = \{-18{,}4°;\ -198{,}4°\}$
(b)	$\sqrt{\cos 9\theta - 2\cos 4\theta.\cos 5\theta}$ $= \sqrt{\cos(4\theta + 5\theta) - 2\cos 4\theta.\cos 5\theta}$ $= \sqrt{\cos 4\theta.\cos 5\theta - \sin 4\theta.\sin 5\theta - 2\cos 4\theta.\cos 5\theta}$ $= \sqrt{-\cos 4\theta.\cos 5\theta - \sin 4\theta.\sin 5\theta}$ $= \sqrt{-(\cos 4\theta - 5\theta)}$ $= \sqrt{-\cos(-\theta)}$ $= \sqrt{-\cos\theta}$ Geldig vir $\cos\theta \leq 0$ $\therefore$ Kwadrant 2 en Kwadrant 3 $\therefore 90° \leq \theta \leq 270°$	✓ $\sqrt{\cos(4\theta + 5\theta) - 2\cos 4\theta.\cos 5\theta}$ ✓ $\sqrt{\cos 4\theta.\cos 5\theta - \sin 4\theta.\sin 5\theta - 2\cos 4\theta.\cos 5\theta}$ ✓ $\sqrt{-\cos(-\theta)}$ ✓ Geldig vir $\cos\theta \leq 0$ ✓ $\theta \in [90°; 270°]$

VRAAG 11

(a)		✓(60;0) en (180;400) ✓(96;100) ✓(135; 200) ✓(144; 300) ✓(174; 380)
(b)	Nee, die afstand is naby aan 120, nie 140 nie. **Alternatief:** Nee, 140 is groter as die mediaan	✓ Die afstand is naby aan 120 nie 140 nie.
(c)	Aangesien die gemiddelde < mediaan, is die data negatief skeef.	✓ gemiddelde < mediaan ✓ negatief skeef.

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VRAAG 12

	In ΔABC: $B\hat{A}C + \hat{B} + \hat{C} = 180°$ ... binne$\angle$e van Δ $\hat{F}_3 = \hat{B}$ ... raaklyn-koord-stelling $\hat{F}_2 = \hat{C}$ ... raaklyn-koord-stelling $\hat{F}_3 + \hat{F}_2 = E\hat{F}D$ $\therefore E\hat{F}D + B\hat{A}C = 180°$ Dus is AEFD 'n koordevierhoek; omgekeerde van teenoorstaande hoeke van koordevierhoek	✓$B\hat{A}C + \hat{B} + \hat{C} = 180°$ ✓$\hat{F}_3 = \hat{B}$ ... raaklyn-koord-st ✓$\hat{F}_2 = \hat{C}$ ... raaklyn-koord-st ✓$\hat{F}_3 + \hat{F}_2 = E\hat{F}D$ $\therefore E\hat{F}D + D\hat{A}E = 180°$ Dus is AEFD 'n koordevierhoek; omgekeerde van teenoorstaande hoeke van koordevierhoek ✓

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VRAAG 13

(a)	$AF = 8$ ... raaklyn van punt af $FC = 21$ ... raaklyn van punt af $\therefore AC = 29$ $BD = 8$ aangesien D die middelpunt is $AB = 16$ eenhede $BE = 8$ eenhede ... raaklyn van punt af $\therefore BC = 29$ eenhede $\cos A\hat{B}C = \frac{29^2 + 16^2 - 29^2}{2 \times 29 \times 16}$ $A\hat{B}C = 73,9866°$ $\approx 74°$	✓ $AF = 8$ ✓ raaklyn van punt af ✓ $AB = 16$ eenhede ✓ raaklyn van punt af ✓ $BC = 29$ eenhede ✓ $A\hat{B}C = 73,9866°$ $\approx 74°$
(b)	Oppervlakte $\Delta BOC = \frac{1}{2} \times 29 \times r$ ... raaklyn $\perp$ rad Oppervlakte $\Delta AOB = \frac{1}{2} \times 16 \times r$ Oppervlakte $\Delta AOC = \frac{1}{2} \times 29 \times r$ Oppervlakte $\Delta ABC = \frac{1}{2} \times 16 \times 29 \times \sin 73,9866°$ $\approx 222,9977516$ $\frac{1}{2} r(29 + 16 + 29) = 222,99516$ $\therefore r = 6$ eenhede **Alternatief:** $\hat{A} = \hat{B} = 74°$ ... AC = BC uit V13a maar $\Delta AFO \equiv \Delta ADO$ (S;S;S) Dus: $\hat{A}_1 = \hat{A}_2 = 37°$ en omdat OF $\perp$ AF (raaklyn $\perp$ rad) $\frac{r}{8} = \tan 37°$ $\therefore r = 6$ eenhede	✓ Opp $\Delta BOC = \frac{1}{2} \times 29 \times r$ ... raaklyn $\perp$ rad Opp $\Delta AOB = \frac{1}{2} \times 16 \times r$ Opp $\Delta AOC = \frac{1}{2} \times 29 \times r$ ✓ Opp $\Delta ABC = \frac{1}{2} \times 16 \times 29 \times \sin 73,9866°$ ✓ $\approx 222,9977516$ ✓ $\frac{1}{2} r(29 + 16 + 29) = 222,99516$ $\therefore r = 6$ eenhede

Totaal: 150 punte

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