

MARKING GUIDELINES / NASIENRIGLYNE

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DATE / DATUM	MAY/JUNE 2026 MEI/JUNIE 2026
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MARK TOTAL / PUNTETOTAAL	150
DURATION (HOURS) / TYDSDUUR (UUR)	3
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SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT

FINAL APPROVED MARKING GUIDELINES / FINAAL GOEDGEKEURDE NASIENRIGLYNE	
DATE OF MEETING / VERGADERINGSDATUM	
UMALUSI MODERATOR / UMALUSI-MODERATOR	
CHIEF MARKER / HOOFNASIENER	
INTERNAL MODERATOR / INTERNE MODERATOR	



NOTE / NOTA:

- If a candidate answered a question **TWICE**, only mark the first attempt. / Indien 'n kandidaat 'n vraag **TWEE KEER** beantwoord het, merk slegs die eerste poging.
- If a candidate cancelled the first attempt and did not answer the question again, mark the cancelled attempt. / Indien 'n kandidaat die eerste poging gekanselleer het en die vraag nie weer beantwoord het nie, merk die gekanselleerde poging.
- The principle of consistent accuracy (**CA**) will be applied throughout the memorandum. / Die beginsel van konsekwente akkuraatheid (**CA**) sal dwarsdeur die memorandum toegepas word.
- If a candidate has given the answer only, without showing any necessary working out, only **ONE** mark will be given. / Indien 'n kandidaat slegs die antwoord gegee het, sonder om enige nodige berekeninge te toon, sal slegs **EEN** punt toegeken word.



QUESTION / VRAAG 1

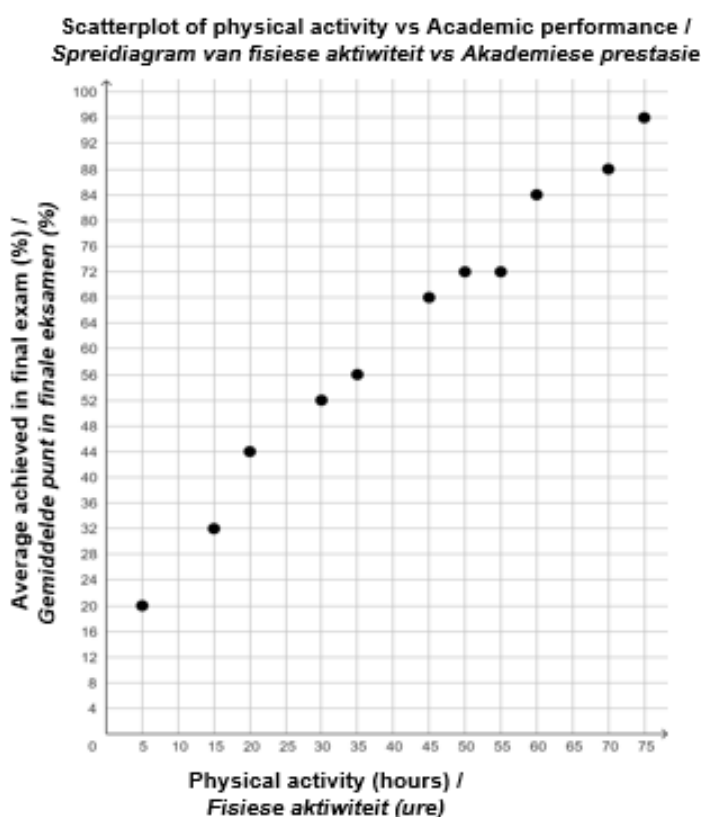
[20]

- 1.1 A poll of 11 high school learners showed a relationship between their physical activity, measured in hours per week, and their academic performance, measured by the percentage achieved in their final exam. / 'n Opname is onder 11 hoërskool leerders gedoen, wat die verband toon tussen hul fisiese aktiwiteit, gemeet in ure per week, en hul akademiese prestasie, gemeet aan die persentasie wat in hul eindeksamen behaal is.

Physical Activity (Hours) / Fisiese Aktiwiteite (Ure)	5	15	20	30	35	45	50	55	60	70	75
Average academic performance (%) / Akademiese gemiddelde punt (%)	20	32	44	52	56	68	72	72	84	88	96

- 1.1.1 Draw a scatterplot of the information ON THE DIAGRAM provided. / Teken 'n spreidingsdiagram van die inligting OP DIE DIAGRAM wat verskaf word.

(3)



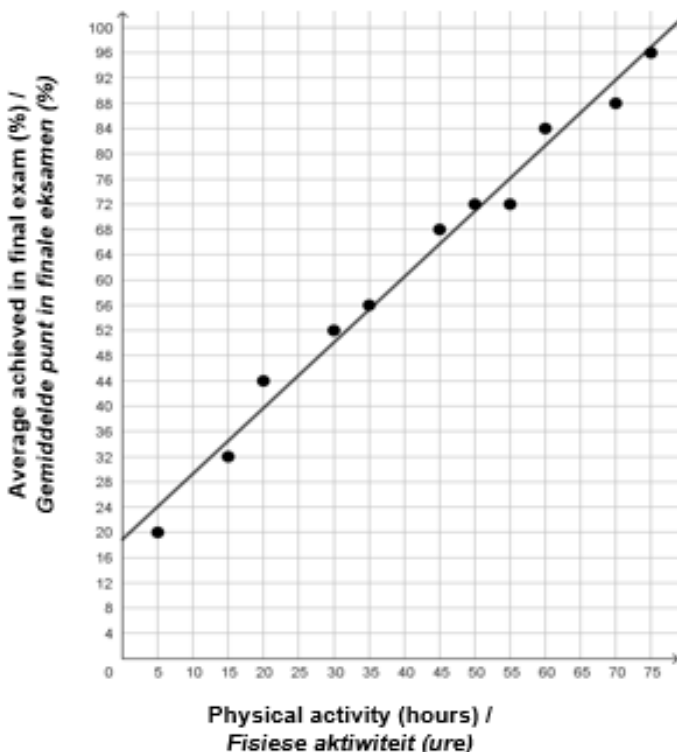
✓ Min value /
 waarde
 (5;20)

✓ Max value
 / Maks
 waarde
 (75;96)

✓ Correct
 plotting of
 the
 balance of
 data points
 / Korrekte
 aanstip
 van res
 van punte

(3)



1.1.2	Determine the least squares regression line for the data. / <i>Bepaal die kleinste kwadrate regressielyn van die data.</i>	
	$A = 18,90$ $B = 1,04$ $y = 1,04x + 18,9$	✓ A and B values / <i>Waardes van A en B</i> ✓ Correct equation / <i>Korrekte vergelyking</i>
1.1.3	Draw the least squares regression line on the scatterplot drawn in QUESTION 1.1.1. / <i>Teken die kleinste kwadrate regressielyn op die verspreidingsgrafiek geteken in VRAAG 1.1.1.</i>	
	Scatterplot of physical activity vs Academic performance / <i>Spreidiagram van fisiese aktiwiteit vs Akademiese prestasie</i>  Average achieved in final exam (%) / <i>Gemiddelde punt in finale eksamen (%)</i> Physical activity (hours) / <i>Fisiese aktiwiteit (ure)</i>	✓ y-intercept (just below 20) / <i>y-afsnit (net onder 20)</i> ✓ Last point, just above 96 / <i>Laaste punt net bokant 96</i> ✓ Any other point / <i>Enige ander punt</i> NOT the line of best fit / <i>NIE die lyn van beste passing nie</i>
1.1.4	If a learner achieved 80% in their academic performance, determine the estimated number of hours they likely would have spent being physically active. / <i>As 'n leerder 80% in hul akademiese prestasie behaal het, bepaal die geskatte aantal ure wat hulle waarskynlik fisies aktief sou gewees het..</i>	
	$y = 1,04x + 18,9$ $80 = 1,04x + 18,9$ $x = 58,75$ hours / <i>uur</i>	✓ $y = 80$ ✓ $x = 58,75$
1.1.5	Determine the correlation coefficient for the data and comment on the correlation. / <i>Bepaal die korrelasiekoëffisiënt van die data en lewer kommentaar oor die korrelasie.</i>	
	$r = 0,99$	✓ 0,99



	(Very) strong positive / (Baie) sterk positief	✓ (very) strong / (baie) sterk ✓ positive / positief
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- 1.2 The investigation is extended to include more learners who are enrolled in formal education and participate in physical activity in South Africa. The data is represented in the below table.
 / Die ondersoek word uitgebrei om meer leerders in te sluit wat in die formele onderwyssektor in Suid-Afrika ingeskryf is en aan fisiese aktiwiteite deelneem. Die data word in die onderstaande tabel voorgestel.

Interval (Hours per week)/ Interval (ure per week)	Frequency/Frekwensie	Cumulative Frequency/ Kumulatiewe frekwensie
$0 \leq x < 2$	16	16
$2 \leq x < 4$	23	A
$4 \leq x < 6$	42	81
$6 \leq x < 8$	B	109
$8 \leq x < 10$	19	128
$10 \leq x < 12$	13	141
$12 \leq x < 14$	3	144
$14 \leq x < 16$	1	145

1.2.1	Write down the values represented by A and B . Skryf die waardes verteenwoordig deur A en B neer.	
	A = 39 B = 28	✓ Answer/ Antwoord ✓ Answer/ Antwoord



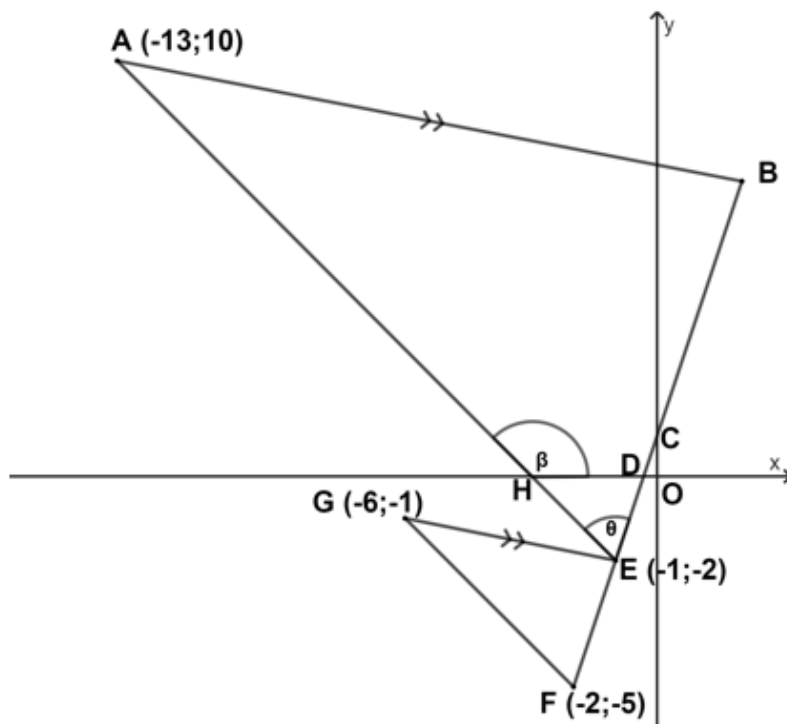
1.2.2	Draw an ogive (cumulative frequency diagram) of the data given in the table provided. / Teken 'n ogief (kumulatiewe frekwensie diagram) van die gegewe data in die tabel voorsien.	(3)
	Ogive of learners weekly participating in physical fitness / Ogief van leerders se weeklikse deelname aan fisiese aktiwiteite Cumulative frequency / Kumulatiewe frekwensie Hours per week/ Ure per week	✓ Anchor Anker ✓ Shape / Vorm ✓ (16;145) (3)
1.2.3	Use your graph to determine the median hours of the data. Indicate on the graph where the answer is determined. / Gebruik jou grafiek om die mediaan ure van die data te bepaal. Toon op die grafiek aan waar die antwoord afgelees is.	(2)
	Ogive of learners weekly participating in physical fitness / Ogief van leerders se weeklikse deelname aan fisiese aktiwiteite Cumulative frequency / Kumulatiewe frekwensie Hours per week/ Ure per week Median hours = 5,7 hours (accept 5,5 – 6) Mediaan ure = 5,7 uur (aanvaar 5,5 – 6)	✓ Answer/ Antwoord ✓ Shown on graph/ Getoon op grafiek (2)
[20]		



QUESTION / VRAAG 2

[22]

In the diagram, $\triangle ABE$ and $\triangle GEF$ is given. $A(-13; 10)$ and $E(-1; -2)$ are vertices of $\triangle ABE$. $G(-6; -1)$, and $F(-2; -5)$ are vertices of $\triangle GEF$. $\widehat{DEH} = \theta$ and $\widehat{DHA} = \beta$. $GE \parallel AB$. D and C are the x - and y -intercepts of line FEB respectively. The gradient of FB is 3. / In die diagram word $\triangle ABE$ en $\triangle GEF$ gegee. $A(-13; 10)$ en $E(-1; -2)$ is hoekpunte van $\triangle ABE$. $G(-6; -1)$, en $F(-2; -5)$ is hoekpunte van $\triangle GEF$. $\widehat{DEH} = \theta$ en $\widehat{DHA} = \beta$. $GE \parallel AB$. D en C is die x - en y -afsnitte van lyn FEB onderskeidelik. Die gradiënt van FB is 3.



2.1 Prove that / Bewys dat: $AE \parallel GF$.

(4)

$$m_{AE} = \frac{10 + 2}{-13 + 1}$$

$$m_{AE} = \frac{12}{-12}$$

$$m_{AE} = -1$$

$$m_{GF} = \frac{-1 + 5}{-6 + 2}$$

$$m_{GF} = -1$$

$$\therefore m_{AE} = m_{GF}$$

$$\therefore AE \parallel GF$$

✓ Corr. subst. in
corr formula / Korr
vervang in korr
formule

$$\checkmark m_{AE} = -1$$

$$\checkmark m_{GF} = -1$$

$$\checkmark m_{AE} = m_{GF}$$

(4)



2.3	Determine the coordinates of B. / Bepaal die koördinate van B.	(6)
	$m_{AB} = m_{GE} = \frac{-1+2}{-6+1} \dots AB \parallel GE$ $m_{AB} = -\frac{1}{5}$ Line / Lyn AB: $y = mx + c$ or/of $y - y_1 = m(x - x_1)$ $10 = -\frac{1}{5}(-13) + c$ $y - 10 = -\frac{1}{5}(x + 13)$ $c = \frac{37}{5} (7,4)$ $y = -\frac{1}{5}x + \frac{37}{5} \quad (y = -0,2x + 7,4)$ Line Lyn EB: $y = mx + c$ or/of $y - y_1 = m(x - x_1)$ $-2 = 3(-1) + c$ $y + 2 = 3(x + 1)$ $c = 1$ $y = 3x + 1$ At / By B: $-\frac{1}{5}x + \frac{37}{5} = 3x + 1$ $x = 2$ $\therefore y = 3(2) + 1 = 7$ B (2;7) OR / OF $m_{AB} = m_{GE} = \frac{-1+2}{-6+1} \dots AB \parallel GE$ $m_{AB} = -\frac{1}{5}$ Line / Lyn EB: $y = mx + c$ or/of $y - y_1 = m(x - x_1)$ $-2 = 3(-1) + c$ $y + 2 = 3(x + 1)$ $c = 1$ $y = 3x + 1$	✓ $m_{AB} = -\frac{1}{5}$ ✓ Corr subst in corr formula / <i>Korr vervang in korr formule</i> ✓ $y = -\frac{1}{5}x + \frac{37}{5}$ ✓ $y = 3x + 1$ ✓ Equate / <i>Stel gelyk</i> ✓ B (2;7) OR / OF ✓ $m_{AB} = -\frac{1}{5}$ ✓ Corr subst in corr formula / <i>Korr vervang in korr formule</i> ✓ $y = 3x + 1$



	Line / Lyn AB: $y = mx + c \quad \text{or/of} \quad y - y_1 = m(x - x_1)$ $10 = -\frac{1}{5}(-13) + c \quad y - 10 = -\frac{1}{5}(x + 13)$ $c = \frac{37}{5} (7,4)$ $y = -\frac{1}{5}x + \frac{37}{5} \quad (y = -0,2x + 7,4)$ At / By B: $-\frac{1}{5}x + \frac{37}{5} = 3x + 1$ $x = 2$ $\therefore y = 3(2) + 1 = 7$ B (2;7)	✓ $y = -\frac{1}{5}x + \frac{37}{5}$ ✓ Equate / Stel gelyk ✓ B (2;7)	(6)
2.4	Prove that / Bewys dat: $\triangle ABE \parallel \triangle GEF$.		(3)
	In $\triangle ABE$ and/en $\triangle GEF$: $\hat{AEB} = \hat{F} \dots \text{Corr } \angle\text{'s}; GF \parallel AE \text{ (2.1)}$ Ooreenk. $\angle$'e; $GF \parallel AE$ (2.1) $\hat{B} = \hat{GEF} \dots \text{Corr } \angle\text{'s}; AB \parallel GE$ Ooreenk $\angle$'e; $AB \parallel GE$ $\hat{G} = \hat{A} \dots 3^{\text{rd}} \angle \text{ of } \triangle$ $\therefore \triangle ABE \parallel \triangle GEF \dots A; A; A$ OR / OF In $\triangle ABE$: $AB = \sqrt{(-13 - 2)^2 + (10 - 7)^2}$ $AB = 3\sqrt{26}$ $BE = 3\sqrt{10}$ $AE = 12\sqrt{2}$ In $\triangle GEF$: $GE = \sqrt{26}$ $EF = \sqrt{10}$ $GF = 4\sqrt{2}$ $\therefore \frac{AB}{GE} = \frac{BE}{EF} = \frac{AE}{GF} = 3$ $\therefore \triangle ABE \parallel \triangle GEF \dots \text{sides in proportion / sye in verhouding}$	✓ S & R ✓ S & R ✓ R OR / OF ✓ AB; BE and/en AE ✓ GE; EF and/en GF ✓ Calculating ratio of sides / Berekening van sye se verhouding	(3)



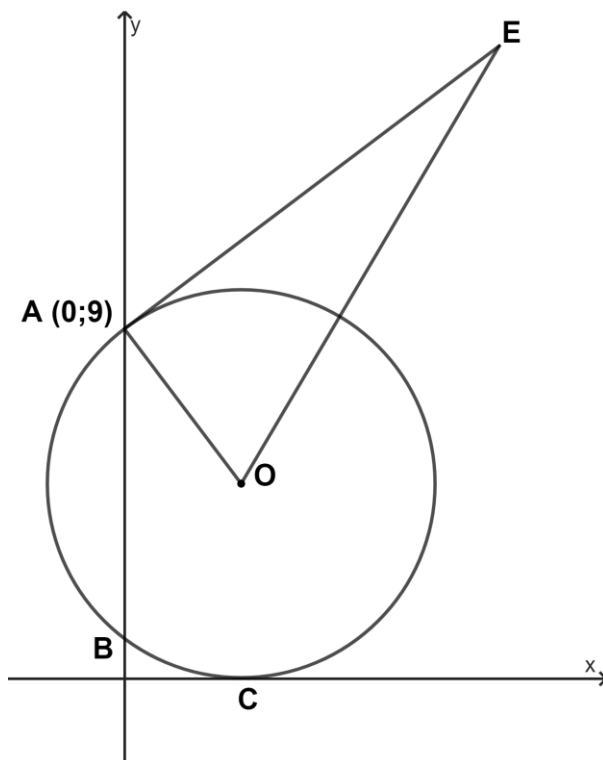
2.5	Calculate / <i>Bereken</i> : $\frac{\text{Area } \triangle ABE}{\text{Area } \triangle GEF}$	(4)
	$\frac{\text{Area } \triangle ABE}{\text{Area } \triangle GEF} = \frac{AE \cdot EB \cdot \sin \theta}{GF \cdot FE \cdot \sin \theta} \checkmark$ $\frac{\text{Area } \triangle ABE}{\text{Area } \triangle GEF} = \frac{12\sqrt{2} \times 3\sqrt{10}}{4\sqrt{2} \times \sqrt{10}} \checkmark$ $\frac{\text{Area } \triangle ABE}{\text{Area } \triangle GEF} = 9 \checkmark$ OR / OF This can also be done from the fact that any side in $\triangle ABE = 3 \times$ the corresponding side in $\triangle GEF$, which means that any 2 sides multiplied will be 9 times. / <i>Dit kan ook gedoen word deurdat enige sy in $\triangle ABE = 3 \times$ die ooreenstemmende sy in $\triangle GEF$ is, wat beteken dat enige 2 sye met mekaar vermenigvuldig 9 keer sal wees.</i>	$\checkmark$ Corr subst in corr formula / <i>Korr vervang in korr formule</i> $\checkmark$ $AE = 12\sqrt{2}$ AND / <i>EN</i> $EB = 3\sqrt{10}$ $\checkmark$ $GF = 4\sqrt{2}$ AND/EN $FE = \sqrt{10}$ $\checkmark$ 9 OR / OF $\checkmark\checkmark$ Correct factor used / <i>Korrekte factor gebruik</i> $\checkmark\checkmark$ Answer / <i>Answer</i> = 9 (4)
[22]		



QUESTION / VRAAG 3

[16]

In the diagram below, the circle with centre O has the equation $x^2 - 6x + 9 = 10y - y^2$. AE is a tangent to the circle at point A(0; 9). The circle touches the x -axis at point C. B is a y -intercept of the circle. / In die onderstaande diagram het die sirkel met middelpunt O die vergelyking $x^2 - 6x + 9 = 10y - y^2$. AE is 'n raaklyn aan die sirkel by punt A(0; 9). Die sirkel raak die x -as by punt C. B is 'n y -afsnit van die sirkel.



3.1 Determine the coordinates of the centre O and the radius of the circle. / Bepaal die koördinate van die middelpunt O en die radius van die sirkel. (4)

$$\begin{aligned} x^2 - 6x + y^2 - 10y &= -9 \\ (x - 3)^2 + (y - 5)^2 &= -9 + 9 + 25 \\ (x - 3)^2 + (y - 5)^2 &= 25 \\ O(3; 5) \\ \text{Radius} &= 5 \end{aligned}$$

$$\begin{aligned} &\checkmark (x - 3)^2 \\ &\checkmark (y - 5)^2 \\ &\checkmark O(3; 5) \\ &\checkmark r = 5 \end{aligned}$$

(4)

3.2 Write down the coordinates of C. / Skryf die koördinate van C neer. (1)

C(3; 0)

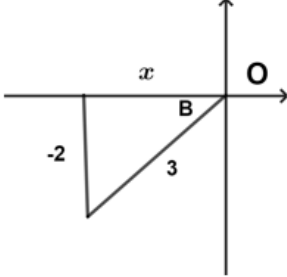
$\checkmark (3; 0)$

(1)



3.3	Determine the equation of the tangent AE. / <i>Bepaal die vergelyking van die raaklyn AE.</i>	(4)
	$m_{AO} = \frac{9-5}{0-3} = -\frac{4}{3}$ $\therefore m_{AE} = \frac{3}{4}$ $c = 9$ $\therefore y = \frac{3}{4}x + 9$	✓ m_{AO} ✓ m_{AE} ✓ $c = 9$ ✓ Equation / Vergelyking (4)
3.4	Determine the coordinates of B. / <i>Bepaal die koördinate van B.</i>	(4)
	$(0-3)^2 + (y-5)^2 = 25$ $9 + y^2 - 10y + 25 - 25 = 0$ $y^2 - 10y + 9 = 0$ $(y-9)(y-1) = 0$ $\therefore B(0;1)$	✓ $x = 0$ ✓ Standard form / Standaardvorm ✓ Factors / Faktore ✓ Coordinates B / Koördinate B (4)
3.5	Another circle with centre P ($a; 2$), and radius 4 units touches the given circle externally. Determine the possible value(s) of a . / <i>'n Ander sirkel met middelpunt P ($a; 2$) en radius 4 eenhede raak die gegewe sirkel uitwendig. Bepaal die moontlike waarde(s) van a.</i>	(3)
	$r_O + r_P = 5 + 4 = 9 \checkmark$ $OP = \sqrt{(a-3)^2 + (2-5)^2}$ $\sqrt{(a-3)^2 + 9} = 9$ $(a-3)^2 = 72$ $a-3 = \pm\sqrt{72}$ $a = 3 \pm 6\sqrt{2}$	✓ $r_O + r_P$ ✓ $\sqrt{(a-3)^2 + 9}$ ✓ $a = 3 \pm 6\sqrt{2}$ (3)
[16]		



QUESTION / VRAAG 4		[27]
4.1	If $\sin B = -\frac{2}{3}$ and $\cos B < 0$, determine without the use of a calculator the value of: / Indien $\sin B = -\frac{2}{3}$ en $\cos B < 0$, bepaal, sonder die gebruik van 'n sakrekenaar , die waarde van:	
4.1.1	$\tan(-B)$	(2)
	$x = -\sqrt{3^2 - (-2)^2} = -\sqrt{5}$ $\tan(-B) = -\tan B$ $= -\left(\frac{-2}{-\sqrt{5}}\right)$ $= -\frac{2}{\sqrt{5}}$ 	$\checkmark x = -\sqrt{5}$ $\checkmark \tan(-B) = -\tan B$ $\checkmark -\frac{2}{\sqrt{5}}$
4.1.2	$9 \sin 2B$	(3)
	$= 9(2 \sin B \cos B)$ $= 18\left(-\frac{2}{3}\right)\left(-\frac{\sqrt{5}}{3}\right)$ $= 4\sqrt{5}$	$\checkmark$ Sin ID $\checkmark$ Subst $\left(-\frac{\sqrt{5}}{3}\right)$ $\checkmark 4\sqrt{5}$
4.2	Simplify fully, without the use of a calculator: / Vereenvoudig volledig, sonder die gebruik van 'n sakrekenaar.	
	$\frac{\cos 385^\circ \cdot \cos 115^\circ \cdot \tan(60^\circ)}{\sin 50^\circ \cdot \tan 30^\circ}$	(6)
	$= \frac{\cos(360^\circ + 25^\circ) \cdot \cos(90^\circ + 25^\circ) \cdot (\sqrt{3})}{\sin(2 \times 35^\circ) \cdot \frac{1}{\sqrt{3}}}$ $= (-3) \frac{\cos 25^\circ (-\sin 25^\circ)}{2 \sin 25^\circ \cos 25^\circ}$ $= \frac{(\sin 25^\circ \cos 25^\circ)}{2 \sin 25^\circ \cos 25^\circ}$ $= -\frac{3}{2}$ OR / OF	$\checkmark \cos(90+25)$ $\checkmark \sqrt{3}$ $\checkmark -\sin 25$ $\checkmark -3$ $\checkmark 2\sin 25\cos 25$ $\checkmark -\frac{3}{2}$ OR / OF



	$= \frac{\cos(360^\circ + 25^\circ) \cdot \cos(180^\circ - 65^\circ) \cdot (-\tan 60^\circ)}{\sin(2 \times 25^\circ) \cdot \tan 60^\circ}$ $= (-3) \frac{\cos 25^\circ (-\cos 65^\circ)}{2 \sin 25^\circ \cos 25^\circ}$ $= \frac{(\sin 25^\circ \cos 25^\circ)}{2 \sin 25^\circ \cos 25^\circ}$ $= -\frac{3}{2}$	✓ $\cos(+25)$ ✓ $\sqrt{3}$ ✓ $-\cos 65$ ✓ -3 ✓ $\sin 25 \cos 25$ ✓ $-\frac{3}{2}$	(6)
4.3.1	Prove that / <i>Bewys dat:</i> $\cos(\theta - 60^\circ) - \cos(\theta + 60^\circ) = \sqrt{3} \sin \theta$		(4)
	$\cos \theta \cos 60^\circ + \sin \theta \sin 60^\circ$ $- [\cos \theta \cos 60^\circ - \sin \theta \sin 60^\circ]$ $= \cos \theta \left(\frac{1}{2}\right) + \sin \theta \left(\frac{\sqrt{3}}{2}\right) - \cos \theta \left(\frac{1}{2}\right) + \sin \theta \left(\frac{\sqrt{3}}{2}\right)$ $= \sqrt{3} \sin \theta$ OR / OF $\cos \theta \cos 60^\circ + \sin \theta \sin 60^\circ$ $- [\cos \theta \cos 60^\circ - \sin \theta \sin 60^\circ]$ $= 2 \sin \theta \sin 60^\circ$ $= \left(\frac{\sqrt{3}}{2}\right) 2 \sin \theta$ $= \sqrt{3} \sin \theta$	✓ double $\angle$ ID / <i>dubbel $\angle$ ID</i> ✓ double $\angle$ ID / <i>dubbel $\angle$ ID</i> ✓ $\frac{\sqrt{3}}{2}$ ✓ $\frac{1}{2}$	(4)
4.3.2	Hence, determine the general solution of the equation: / <i>Bepaal vervolgens die algemene oplossing van die vergelyking:</i> $\cos(\theta - 60^\circ) - \cos(\theta + 60^\circ) = 2 \sin^2 \theta$		(6)
	$\therefore 2 \sin^2 \theta = \sqrt{3} \sin \theta$ $2 \sin^2 \theta - \sqrt{3} \sin \theta = 0$ $\sin \theta (2 \sin \theta - \sqrt{3}) = 0$ $\sin \theta = 0 \quad \text{or/of} \quad \sin \theta = \frac{\sqrt{3}}{2}$ $\theta = 0^\circ + 180^\circ k, k \in \mathbb{Z} \quad \text{or/of} \quad \theta = 60^\circ + 360^\circ k, k \in \mathbb{Z}$ $\text{Or/Of} \quad \theta = 120^\circ + 360^\circ k, k \in \mathbb{Z}$	✓ $2 \sin^2 \theta = \sqrt{3} \sin \theta$ ✓ Std form <i>Stdvorm</i> ✓ Factorisation / Faktorisering ✓ $\theta = 0^\circ +$ $180^\circ k, k \in \mathbb{Z}$ ✓ $\theta = 60^\circ +$ $360^\circ k, k \in \mathbb{Z}$ ✓ $\theta = 120^\circ +$ $360^\circ k, k \in \mathbb{Z}$	



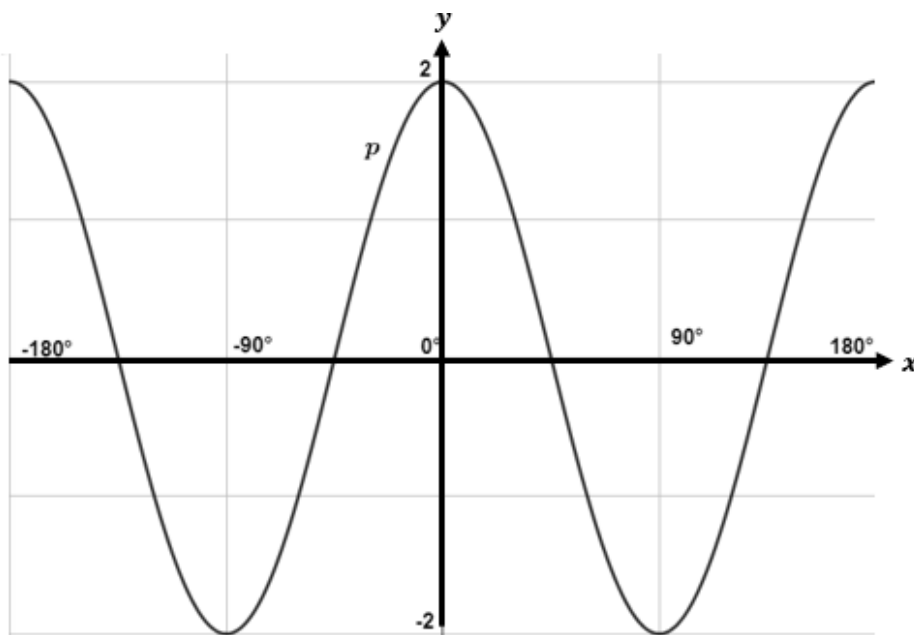
4.4	Determine, without the use of a calculator , the value of: / <i>Bepaal, sonder die gebruik van 'n sakrekenaar, die waarde van:</i> $\cos^2 32^\circ + \cos^2 33^\circ + \dots + \cos^2 57^\circ + \cos^2 58^\circ$		(6)
	$\cos^2 57^\circ = \cos^2(90^\circ - 33^\circ)$ $\cos^2 58^\circ = \cos^2(90^\circ - 32^\circ)$ $\cos^2 32^\circ + \cos^2 33^\circ + \dots + \sin^2 33^\circ + \sin^2 32^\circ$ $n = 26 + \cos^2 45$ $S_{27} = \frac{1}{2}[26] + \left(\frac{1}{\sqrt{2}}\right)^2$ $S_{27} = 13,5$ OR / OF $\cos^2 32^\circ + \cos^2 33^\circ + \dots + \cos^2 57^\circ + \cos^2 58^\circ$ $= \sin^2 58^\circ + \sin^2 57^\circ + \dots + \cos^2 57^\circ + \cos^2 58^\circ$ $= \cos^2 45^\circ + (\sin^2 46^\circ + \cos^2 46^\circ) + \dots + (\sin^2 57^\circ + \cos^2 58^\circ)$ $= \left(\frac{1}{\sqrt{2}}\right)^2 + 1 \times 13$ $= 13,5$	$\checkmark n = 27$ $\checkmark$ Rewriting as co-function / <i>Herskryf as kofunksie</i> $\checkmark \sin^2 + \cos^2 = 1$ $\checkmark \cos^2 45$ $\checkmark \frac{1}{2}(26)$ $\checkmark 13,5$ OR / OF $\checkmark \checkmark$ Rewriting as co-function / <i>Herskryf as kofunksie</i> $\checkmark \frac{1}{\sqrt{2}}$ $\checkmark 1$ $\checkmark 13$ $\checkmark 13,5$	(6)
[27]			



QUESTION / VRAAG 5

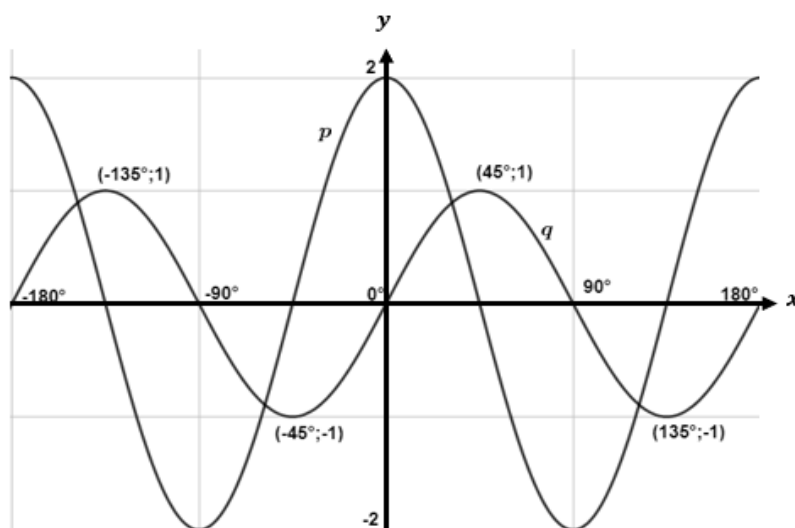
[14]

In the diagram below the graph of $p(x) = 2 \cos 2x$ is drawn for the interval $x \in [-180^\circ; 180^\circ]$. / In die onderstaande diagram is die grafiek van $p(x) = 2 \cos 2x$ geteken vir die interval $x \in [-180^\circ; 180^\circ]$.



5.1 On the same system of axes on which p is drawn, draw the graph of $q(x) = \sin 2x$ for $x \in [-180^\circ; 180^\circ]$. Clearly show all intercepts with the axes, the coordinates of the turning points and end points of the graph. / Teken die grafiek van $q(x) = \sin 2x$ vir $x \in [-180^\circ; 180^\circ]$ op dieselfde assestelsel waarop p geteken is. Toon duidelik alle afsnitte met die asse, die koördinate van die draaipunte en die eindpunte van die grafiek aan.

(4)



✓ Turning points
/ Draaipunte
(4)

✓ x –intercepts /
afsnitte / (5)

✓ y
-intercept / afsnit

✓ Shape / Vorm

(4)



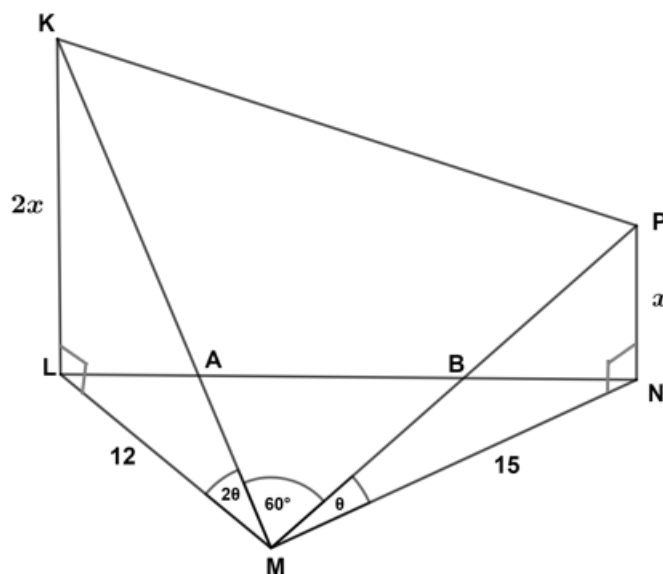
5.2	Write down the range of $p(x) - 3$. / Skryf die waardeversameling van $p(x) - 3$ neer.		(2)
	$y \in [-5; -1]$ OR / OF $-5 \leq y \leq -1$	✓ Critical values / <i>Kritiese waardes</i> ✓ Notation / <i>Notasie</i>	(2)
5.3	Calculate the solution of $p(x) = q(x)$ in the interval $x \in [-180^\circ; 180^\circ]$. / Bereken die oplossing van $p(x) = q(x)$ vir die interval $x \in [-180^\circ; 180^\circ]$.		(6)
	$2 \cos 2x = \sin 2x$ $2 = \frac{\sin 2x}{\cos 2x}$ $\tan 2x = 2$ RA/VH: $2x = 63,43^\circ$ $2x = 63,43^\circ + 180^\circ k$ $x = 31,72^\circ + 90^\circ k; k \in \mathbb{Z}$ $x \in \{-148,28^\circ; -58,28^\circ; 31,72^\circ; 121,72^\circ\}$	✓ $\div \cos 2x$ ✓ $\tan 2x = 2$ ✓ RA / VH ✓ $x = 31,72^\circ + 90^\circ k; k \in \mathbb{Z}$ ✓ $-148,28^\circ; -58,28^\circ$ ✓ $31,72^\circ; 121,72^\circ$	(6)
5.4	Hence, using the answers obtained in QUESTION 5.3 and the graph, determine the value(s) of x for which $p(x) < q(x)$ in the interval $x \in [-180^\circ; 180^\circ]$. / Gebruik vervolgens die antwoorde verkry in VRAAG 5.3 en die grafiek om die waarde(s) van x te bepaal waarvoor $p(x) < q(x)$ is in die interval $x \in [-180^\circ; 180^\circ]$.		(2)
	$x \in (-148,28^\circ; -58,28^\circ)$ OR / OF $x \in (31,72^\circ; 121,72^\circ)$	✓ $(-148,28^\circ; -58,28^\circ)$ ✓ $(31,72^\circ; 121,72^\circ)$	(2)
[14]			



QUESTION 6

[9]

In the diagram, M, N and L are points on the same horizontal plane. KL and PN are vertical poles. Steel cables KM and PM anchor the poles at M. Another steel cable connects K and P. $LM = 12$ m; $PN = x$ m; $\widehat{KMP} = 60^\circ$, $KL = 2x$ m, $MN = 15$ m, $\widehat{LMK} = 2\theta$ and $\widehat{PMN} = \theta$. / In die diagram is M, N en L punte op dieselfde horisontale vlak. KL en PN is vertikale pale. Staalkabels KM en PM anker die pale by M. Nog 'n staalkabel verbind K en P. $LM = 12$ m; $PN = x$ m; $\widehat{KMP} = 60^\circ$, $KL = 2x$ m, $MN = 15$ m, $\widehat{LMK} = 2\theta$ en $\widehat{PMN} = \theta$.



6.1 Show that / Toon aan dat: $KM = \frac{x}{\sin \theta \cos \theta}$ (2)

$$\sin 2\theta = \frac{2x}{KM}$$

$$KM = \frac{2x}{\sin 2\theta}$$

$$KM = \frac{2x}{2 \sin \theta \cos \theta}$$

$$KM = \frac{x}{\sin \theta \cos \theta}$$

- ✓ Sin ratio
- ✓ Double angle ID / Dubbelhoek ID

(2)



6.2	Prove that / <i>Bewys dat</i> : $KP = \frac{x(\sqrt{\cos^2 \theta - \cos \theta + 1})}{\sin \theta \cos \theta}$		(5)
	$KP^2 = KM^2 + MP^2 - 2KM \cdot MP \cos 60^\circ$ $KP^2 = \left(\frac{x}{\sin \theta \cos \theta}\right)^2 + \left(\frac{x}{\sin \theta}\right)^2 - 2\left(\frac{x}{\sin \theta \cos \theta}\right)\left(\frac{x}{\sin \theta}\right)\left(\frac{1}{2}\right)$ $KP^2 = \frac{x^2}{\sin^2 \theta \cos^2 \theta} + \frac{x^2}{\sin^2 \theta} - \frac{x^2}{\sin^2 \theta \cos \theta}$ $KP^2 = \frac{x^2 + x^2 \cos^2 \theta - x^2 \cos \theta}{\sin^2 \theta \cos^2 \theta}$ $KP^2 = \frac{x^2(1 + \cos^2 \theta - \cos \theta)}{\sin^2 \theta \cos^2 \theta}$ $KP = \frac{x(\sqrt{\cos^2 \theta - \cos \theta + 1})}{\sin \theta \cos \theta}$	✓ cos rule / <i>cos-reël</i> ✓ $MP = \frac{x}{\sin \theta}$ ✓ $\frac{1}{2}$ ✓ LCD / KGV ✓ Factorise / <i>Faktoriseer</i>	
6.3	Determine the length of KP if $x = 18\text{m}$ and $\theta = 17^\circ$. / <i>Bepaal die lengte van KP indien $x = 18\text{m}$ en $\theta = 17^\circ$.</i>		(2)
	$KP = \frac{x(\sqrt{\cos^2 \theta - \cos \theta + 1})}{\sin \theta \cos \theta}$ $KP = \frac{18(\sqrt{\cos^2 17 - \cos 17^\circ + 1})}{\sin 17^\circ \cos 17^\circ}$ $KP = 63,02 \text{ m}$	✓ Substitute / <i>Vervang</i> ✓ Answer / <i>Antwoord</i>	(2)
[9]			

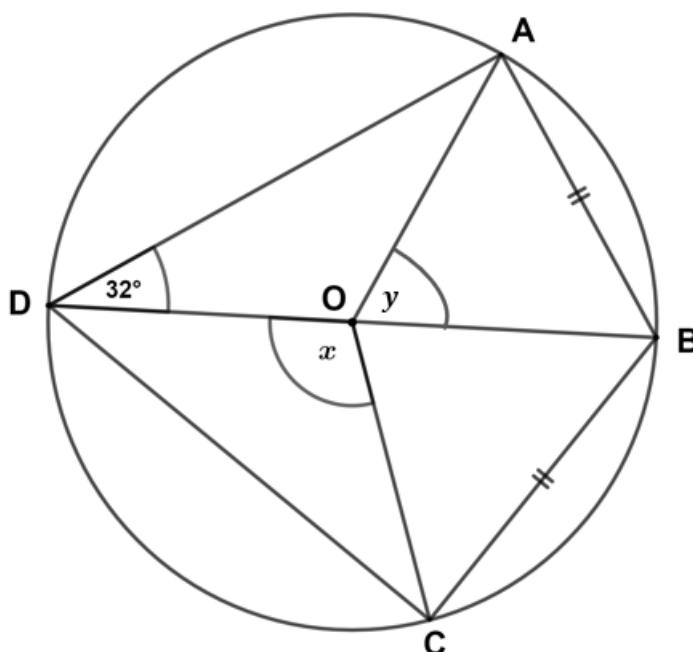


QUESTION / VRAAG 7

[11]

7.1 In the diagram / In die diagram:

- A, B, C and D are points on the circumference of the circle with centre O. / A, B, C en D is punte op die omtrek van die sirkel met middelpunt O.
- DB is the diameter of the circle. / DB is die middellyn van die sirkel.
- $AB = BC$.
- $\widehat{ADB} = 32^\circ$.
- $\widehat{DOC} = x$.
- $\widehat{AOB} = y$.



7.1.1 Determine, with reasons, the size of x . / Bepaal, met redes, die grootte van x .

(4)

$\widehat{CDO} = \widehat{ADO} = 32^\circ$... $\angle$'s subtended by equal chords

$\widehat{DCO} = \widehat{OCD} = 32^\circ$... $\angle$'s opp = sides (radii)

$x = 180^\circ - 64^\circ$... sum int. $\angle$'s of Δ

$x = 116^\circ$

✓ S & R

✓ S & R

✓ S & R

✓ Answer /

Antwoord

(4)

7.1.2 Determine, with reasons, the size of y . / Bepaal, met redes, die grootte van y .

(2)

$y = 2 \times 32^\circ = 64^\circ$... $\angle$ at centre = $2 \times \angle$ at circum

✓ S ✓ R

OR / OF

$\widehat{DAO} = \widehat{DOA} = 32^\circ$... $\angle$'s opp = sides (radii)

$y = \widehat{DAO} + \widehat{DOA} = 64^\circ$... ext $\angle \Delta$ = sum int opp $\angle$ s

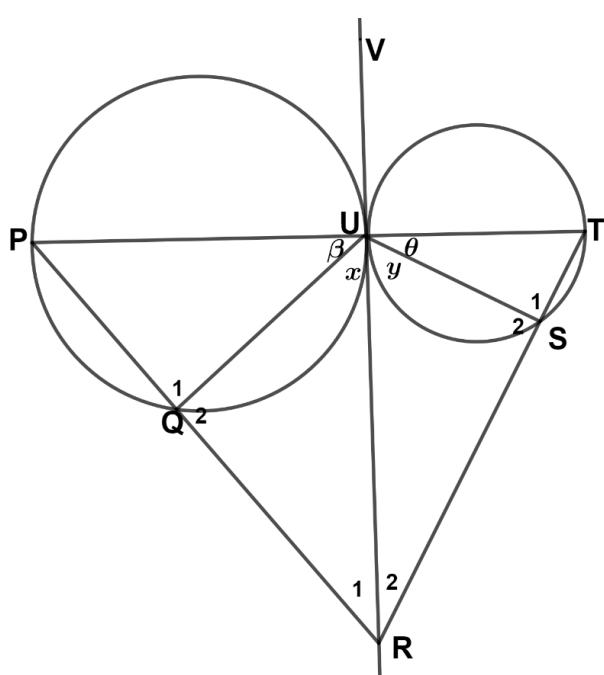
OR / OF

✓ S & R

✓ S & R

(2)



7.2	In the diagram / <i>In die diagram</i>: • VR is a common tangent to the two given circles at U. / <i>Is VR 'n gemeenskaplike raaklyn aan die twee gegewe sirkels by U.</i> • P and Q are points on the larger circle. / <i>P en Q is punte op die groter sirkel.</i> • T and S are points on the smaller circle. / <i>T en S is punte op die kleiner sirkel.</i> • PUT, PQR and TSR are straight lines. / <i>PUT, PQR en TSR is reguitlyne.</i> • $\widehat{P\hat{U}Q} = \beta$. • $\widehat{Q\hat{U}R} = x$. • $\widehat{S\hat{U}R} = y$. • $\widehat{S\hat{U}T} = \theta$. 																									
	Prove, with reasons, RQUS is a cyclic quadrilateral. / <i>Bewys, met redes, dat RQUS 'n koordevierhoek is.</i>	(5)																								
	<table><tr><td>$\theta + y + x + \beta = 180^\circ$</td><td>... $\angle$'s on straight line PUT $\angle$'e op reguitlyn PUT</td></tr><tr><td>$\hat{P} = x$</td><td>... tan-chord theorem / raaklyn-koord stelling</td></tr><tr><td>$\hat{T} = y$</td><td>... tan-chord theorem / raaklyn-koord stelling</td></tr><tr><td>$\hat{Q}_2 = x + \beta$</td><td>... Ext $\angle$ = sum opp int $\angle$'s Buite$\angle$ = som t.o.binne$\angle$'e</td></tr><tr><td>$\hat{S}_2 = y + \theta$</td><td>... Ext $\angle$ = sum opp int $\angle$'s Buite$\angle$ = som t.o.binne$\angle$'e</td></tr><tr><td>$\hat{Q}_2 + \hat{S}_2 = x + \beta + y + \theta$</td><td></td></tr><tr><td>$\therefore \hat{Q}_2 + \hat{S}_2 = 180^\circ$</td><td></td></tr><tr><td>RQUS is a cyclic quad</td><td>... Opp $\angle$'s supplementary /</td></tr><tr><td>RQUS is 'n kvh</td><td>... T.O $\angle$'e supplementêr</td></tr></table>	$\theta + y + x + \beta = 180^\circ$	... $\angle$'s on straight line PUT $\angle$ 'e op reguitlyn PUT	$\hat{P} = x$	... tan-chord theorem / raaklyn-koord stelling	$\hat{T} = y$	... tan-chord theorem / raaklyn-koord stelling	$\hat{Q}_2 = x + \beta$	... Ext $\angle$ = sum opp int $\angle$'s Buite $\angle$ = som t.o.binne $\angle$ 'e	$\hat{S}_2 = y + \theta$	... Ext $\angle$ = sum opp int $\angle$'s Buite $\angle$ = som t.o.binne $\angle$ 'e	$\hat{Q}_2 + \hat{S}_2 = x + \beta + y + \theta$		$\therefore \hat{Q}_2 + \hat{S}_2 = 180^\circ$		RQUS is a cyclic quad	... Opp $\angle$'s supplementary /	RQUS is 'n kvh	... T.O $\angle$ 'e supplementêr	<table><tr><td>✓ S & R</td></tr><tr><td>✓ S & R (both tan-chord / beide raaklyn-koord)</td></tr><tr><td>✓ S & R (both ext $\angle$'s / beide buite $\angle$'e)</td></tr><tr><td> </td></tr><tr><td>✓ S</td></tr><tr><td>✓ R</td></tr></table>	✓ S & R	✓ S & R (both tan-chord / beide raaklyn-koord)	✓ S & R (both ext $\angle$'s / beide buite $\angle$ 'e)		✓ S	✓ R
$\theta + y + x + \beta = 180^\circ$	... $\angle$'s on straight line PUT $\angle$ 'e op reguitlyn PUT																									
$\hat{P} = x$	... tan-chord theorem / raaklyn-koord stelling																									
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✓ S																										
✓ R																										



OR / OF $\theta + y + x + \beta = 180^\circ$. . . $\angle$'s on straight line PUT $\angle$'e op reguitlyn PUT $\hat{P} = x$. . . tan-chord theorem / <i>raaklyn-koord stelling</i> $\hat{T} = y$. . . tan-chord theorem / <i>raaklyn-koord stelling</i> $\hat{Q}_2 = x + \beta$. . . Ext $\angle$ = sum opp int $\angle$'s <i>Buite$\angle$ = som t.o.binne$\angle$'e</i> $\hat{S}_2 = y + \theta$. . . Ext $\angle$ = sum opp int $\angle$'s <i>Buite$\angle$ = som t.o.binne$\angle$'e</i> $\hat{R}_1 = 180^\circ - (2x + \beta)$. . . Sum int $\angle$'s of Δ / <i>Som binne $\angle$'e van Δ</i> $\hat{R}_2 = 180^\circ - (2x + \theta)$. . . Sum int $\angle$'s of Δ / <i>Som binne $\angle$'e van Δ</i> $Q\hat{U}S + Q\hat{R}S$ $= x + y + 180^\circ - (2x + \beta) + 180^\circ - (2x + \theta)$ $= 360^\circ - (\theta + y + x + \beta)$ $= 360^\circ - (180^\circ) = 180^\circ$ $\therefore Q\hat{U}S + Q\hat{R}S = 180^\circ$ RQUS is a cyclic quad . . . Opp $\angle$'s supplementary <i>RQUS is 'n kvh . . . T.O $\angle$'e supplementer</i> OR / OF $\hat{P} = x$. . . tan-chord theorem / <i>raaklyn-koord stelling</i> $\hat{T} = y$. . . tan-chord theorem / <i>raaklyn-koord stelling</i> $\hat{R} = 180^\circ - (x + y)$. . . Sum int $\angle$'s of Δ / <i>Som binne $\angle$'e van Δ</i> $\hat{R} + Q\hat{U}S = x + y + 180^\circ - (x + y)$ $\hat{R} + Q\hat{U}S = 180$ RQUS is a cyclic quad . . . Opp $\angle$'s supplementary <i>RQUS is 'n kvh . . . T.O $\angle$'e supplementer</i>	OR / OF ✓ S & R ✓ S & R (both tan-chord) ✓ S & R (both ext $\angle$) ✓ S ✓ R OR / OF ✓ S & R ✓ S & R ✓ S & R ✓ S ✓ R	(5)
[11]		



QUESTION / VRAAG 8			[14]
8.1	In the diagram / <i>In die diagram:</i> - A, B and D are points on the circumference of the circle with centre H. / <i>Is A, B en D punte op die omtrek van die sirkel met middelpunt H.</i> $AF = DF$. $\hat{A} = 40^\circ$. - AB extended meet HF extended in C. / <i>AB verleng ontmoet FH verleng in C.</i> - CHF is a straight line.		
	Determine, with reasons: / <i>Bepaal, met redes:</i>		
8.1.1	The size of $\hat{BHD}$. / <i>Die grootte van $\hat{BHD}$.</i>		(2)
	$\hat{BHD} = 80^\circ$... $\angle$ at centre = $2 \times \angle$ at circumf. / <i>Mdpts $\angle = 2 \times$ omtreks$\angle$</i>	✓ S ✓ R	(2)
8.1.2	The size of $\hat{C}$. / <i>Die grootte van $\hat{C}$.</i>		(2)
	$\hat{F}_1 = 90^\circ$... Line from centre to midpoint of chord <i>Lyn vanuit mdpt na mdpt van koord</i> $\hat{C} = 180^\circ - 90^\circ - 40^\circ = 50$... Sum of int $\angle$'s of Δ <i>Som binne $\angle$'e van Δ</i>	✓ S & R ✓ S & R	(2)

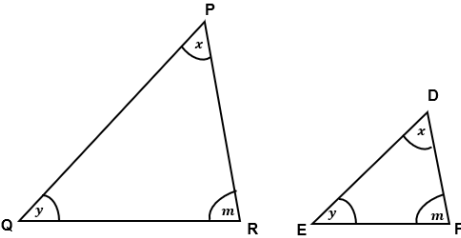
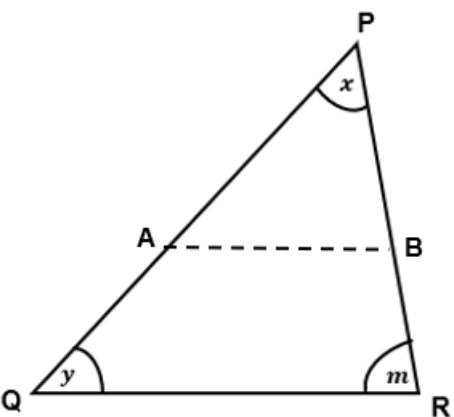


8.2	In the diagram / <i>In die diagram:</i> - K, L, M and P are points on the circumference of the circle with centre O. / <i>Is K, L, M en P punte op die omtrek van die sirkel met middelpunt O.</i> - LM produced intersects circle LOPN at N. / <i>LM verleng sny sirkel LOPN by N.</i> $\widehat{K} = y$. - LM : MN = 5 : 2.	
8.2.1	Determine, with reasons, the size of $\widehat{N}$ in terms of y. / <i>Bepaal, met redes, die grootte van $\widehat{N}$ in terme van y.</i>	
	$\widehat{LOP} = 2y$... $\angle$ at centre = $2x\angle$ at circumf. $\widehat{N} = 180^\circ - 2y$... Opp int $\angle$'s of cyclic quad suppl. <i>T.o. $\angle$'e van KVH is suppl</i>	$\checkmark$ S & R $\checkmark$ S & R
		(2)

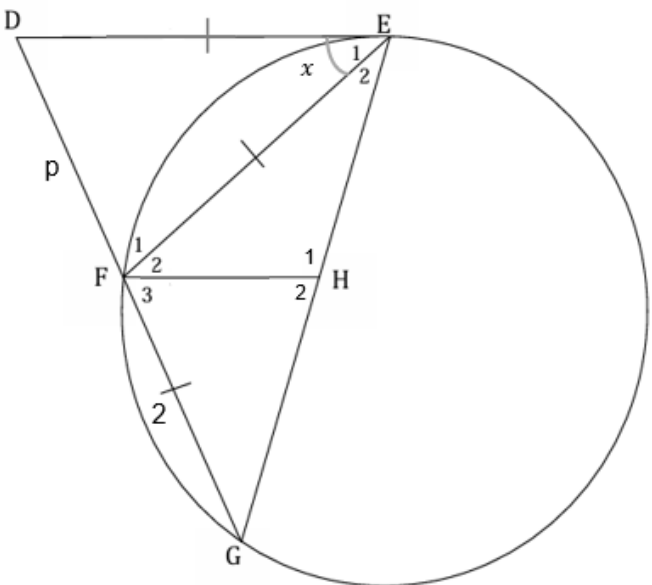


8.2.2	Show that $LK \parallel MP$. / <i>Toon dat: $LK \parallel MP$.</i>		(3)
	$\widehat{KLN} = y$... Sum of int $\angle$'s of ΔKLN <i>Som binne $\angle$'e van ΔKLN</i> $\widehat{M}_2 = y$... Ext $\angle$ cyclic quad $KLMP$ <i>Buite$\angle$ kvh $KLMP$</i> $\therefore \widehat{KLN} = \widehat{M}_2$ $LK \parallel MP$... Corrsp. $\angle$'s are equal <i>Ooreenkomst $\angle$'e is gelyk</i> OR / OF $\widehat{M}_2 = \widehat{K} = y$... Ext $\angle$ cyclic quad $KLMP$ <i>Buite$\angle$ kvh $KLMP$</i> $\widehat{P}_4 = y$... Sum of int $\angle$'s of ΔMNP <i>Som binne $\angle$'e van ΔMNP</i> $\therefore \widehat{M}_2 = \widehat{P}_4$ $LK \parallel MP$... Corresp. $\angle$'s are equal <i>Ooreenkomst $\angle$'e is gelyk</i> OR / OF $\widehat{KLN} = y$... Sum of int $\angle$'s of ΔKLN <i>Som binne $\angle$'e van ΔKLN</i> $\widehat{M}_1 = 180^\circ - y$... $\angle$'s on straight line/ $\angle$ 'e op reguitlyn $\widehat{KLN} + \widehat{M}_1 = y + 180^\circ - y = 180^\circ$ $LK \parallel MP$... Co-int $\angle$'s are supplementary <i>Ko-binne $\angle$'e is suppl.</i>	✓ S & R ✓ S & R ✓ R OR / OF ✓ S & R ✓ S & R ✓ R OR / OF ✓ S & R ✓ S & R ✓ R	(3)
8.2.3	Determine the value of / <i>Bepaal die waarde van $\frac{LK}{MP}$.</i>		(5)
	In ΔPMN and ΔKLN $\widehat{N} = \widehat{N}$... Common $\angle$ / <i>Gemene $\angle$</i> $\widehat{M}_2 = \widehat{KLN}$... Proven / <i>Bewys</i> $\widehat{P}_4 = \widehat{K}$... Sum of int $\angle$'s of Δ <i>Som binne $\angle$'e van Δ</i> $\Delta PMN \parallel \Delta KLN$... A, A, A ; H; H; H $\therefore \frac{LK}{MP} = \frac{LN}{MN} = \frac{7}{2}$... $\Delta PMN \parallel \Delta KLN$	✓ S & R ✓ S & R ✓ R ✓ S & R ✓ Answer / <i>Antwoord</i>	(5)
[14]			



QUESTION / VRAAG 9		[17]
9.1	In the diagram below ΔPQR and ΔDEF are given with: <i>In die onderstaande diagram word ΔPQR en ΔDEF gegee met:</i> $\hat{P} = \hat{D} = x$; $\hat{Q} = \hat{E} = y$ $\hat{R} = \hat{F} = m$. Prove the theorem that states that / <i>Bewys die stelling wat beweer dat:</i> $\frac{PQ}{DE} = \frac{QR}{EF}.$	(6)
		
		
	Construction: Draw AB such that PA = DE; and PB = DF/ <i>Konstruksie: Trek AB sodanig dat PA = DE; en PB = DF.</i> In ΔPAB and/en ΔDEF: PA = DE . . . Construction / <i>Konstruksie</i> $\hat{P} = \hat{D}$. . . Given / <i>Gegee</i> PB = DF . . . Construction / <i>Konstruksie</i> $\therefore \Delta PAB \equiv \Delta DEF$. . . S; A ; S (S; H; S) $\therefore \hat{PAB} = \hat{E} = y$. . . $\Delta PAB \equiv \Delta DEF$ $\therefore AB \parallel QR$. . . Corr $\angle$'s equal / <i>Ooreenk $\angle$'e =</i> $\therefore \frac{PQ}{PA} = \frac{PR}{PB}$. . . Prop. Theorem OR line $\parallel$ one side of Δ <i>Ewer. Stelling OF lyn $\parallel$ een sy Δ</i> But/ <i>Maar</i> PA = DE and / <i>en</i> PB = DF; $\therefore \frac{PQ}{DE} = \frac{PR}{DF}$	✓ Constr. / <i>Konstr.</i> ✓ S & R ✓ S & R ✓ $\equiv$ ✓ S & R ✓ S & R (6)



9.2	In the diagram / <i>In die diagram</i>: - E, F and G are points on the circumference of a circle. / <i>Is E, F en G punte op die omtrek van 'n sirkel.</i> - DE is a tangent to the circle EFG at E. / <i>Is DE is 'n raaklyn aan die sirkel EFG by E.</i> - DFG intersect the circle at F and G. / <i>Sny DFG die sirkel by F en G/</i> - DE = EF = FG. - FH is drawn. / <i>FH is getrek.</i> $\hat{E}_1 = x$. - DF = p units and FG = 2 units. / <i>DF = p eenhede en FG = 2 eenhede</i>	
		
9.2.1	Prove that / <i>Bewys dat</i>: $p^2 + 2p = 4$.	(5)
	In $\triangle DEF$ and / <i>en</i> $\triangle DGE$: $\hat{E}_1 = \hat{G}$. . . tan-chord theorem / <i>raaklyn-koord stelling</i> $\hat{D} = \hat{D}$. . . common $\angle$ / <i>gemene $\angle$</i> $\hat{F}_1 = \hat{DEG}$. . . proven / <i>3rd $\angle$ of $\triangle$</i> <i>bewys / 3^{de} $\angle$ van $\triangle$</i> $\therefore \triangle DEF \parallel \triangle DGE$. . . A; A; A (<i>H; H; H</i>) $\frac{DF}{DE} = \frac{DE}{DG}$. . . $\triangle DEF \parallel \triangle DGE$ $DE^2 = DF \cdot DG$ $(2)^2 = p \times (p + 2)$ $4 = p^2 + 2p$	✓ S & R ✓ S & R ✓ R ✓ Ratio ✓ Subst. / <i>Vervang</i> (5)



9.2.2	If $\frac{GH}{GE} = \frac{2}{p+2}$, prove that $DE \parallel FH$. Indien $\frac{GH}{GE} = \frac{2}{p+2}$, bewys dat $DE \parallel FH$.	(1)
	$\frac{GF}{FD} = \frac{2}{p+2}$. . . given / gegee $\therefore \frac{GF}{FD} = \frac{GH}{GE}$ $\therefore DE \parallel FH$. . . converse prop theorem / omgekeerde eweredigh. stelling	✓ R (1)
9.2.3	Prove that / Bewys dat: $\triangle DFE \parallel \triangle HFG$	(4)
	$\hat{E}_2 = x$. . . $\angle$'s opp = sides ($FG = FE$) $\angle$'e t.o. = sye ($FG = FE$) $\hat{F}_1 = \hat{D}\hat{E}G$. . . proven / bewys $\hat{D}\hat{E}G = 2x = \hat{H}_2$. . . Corr $\angle$'s; $FH \parallel DE$ <i>Ooreenk. $\angle$'e; $FH \parallel DE$</i> $\hat{D} = \hat{F}_1 = 2x$. . . $\angle$'s opp = sides ($DE = FE$) $\angle$'e t.o. = sye ($DE = FE$) In $\triangle DFE$ and/en $\triangle HFG$: $\hat{E}_1 = \hat{G}$. . . tan-chord theorem / raaklyn-koord stelling $\hat{D} = \hat{H}_2$. . . both / beide = $2x$ $\hat{F}_1 = \hat{F}_3$. . . 3rd $\angle$ of $\triangle$ / 3^{de} $\angle$ van $\triangle$ $\triangle DFE \parallel \triangle HFG$. . . A; A; A ($H; H; H$)	✓ S & R ✓ S & R ✓ S & R ✓ R (4)
9.2.4	Give a reason why HFDE is a cyclic quadrilateral. Gee 'n rede waarom HFDE 'n koordevierhoek is.	(1)
	$\hat{H}_2 = \hat{D}$ $\therefore HFDE$ is cyclic quad . . . Converse ext. $\angle$ = opp. int $\angle$ <i>Omgekeerde buite $\angle$ = t.o binne $\angle$</i>	✓ R (1)
[17]		
GRAND TOTAL / GROOTTOTAAL: [150]		