



Province of the  
**EASTERN CAPE**  
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo  
Provinsie van die Oos Kaap: Department van Onderwys  
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

**NATIONAL SENIOR  
CERTIFICATE/*NASIONALE  
SENIORSERTIFIKAAT***

**GRADE/*GRAAD* 12**

**SEPTEMBER 2024**

**TECHNICAL MATHEMATICS P2/*TEGNIESE WISKUNDE V2*  
MARKING GUIDELINE/*NASIENRIGLYN***

**MARKS/*PUNTE*: 150**

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This marking guideline consists of 21 pages./  
*Hierdie nasienriglyn bestaan uit 21 bladsye.*

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**NOTE:**

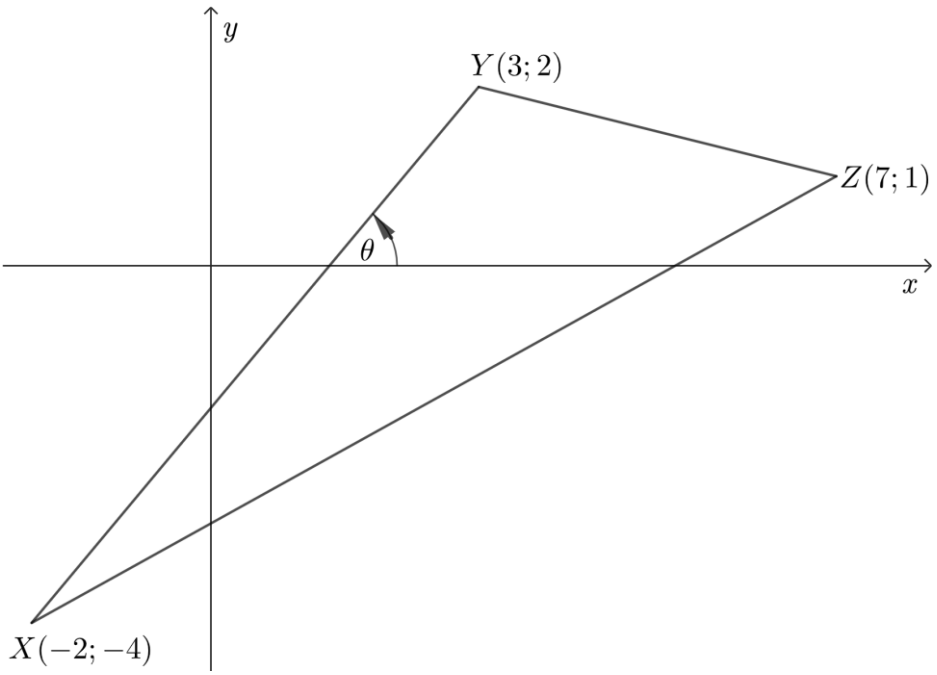
- Continuous accuracy (CA) applies only where indicated in this marking guideline.
- Assuming values/answers in order to solve a problem is unacceptable.

**LET WEL:**

- *Volgehoue akkuraatheid (CA) is slegs van toepassing soos aangedui in hierdie nasienriglyn.*
- *Aanvaarding van waardes/antwoorde om 'n problem op te los, is onaanvaarbaar.*

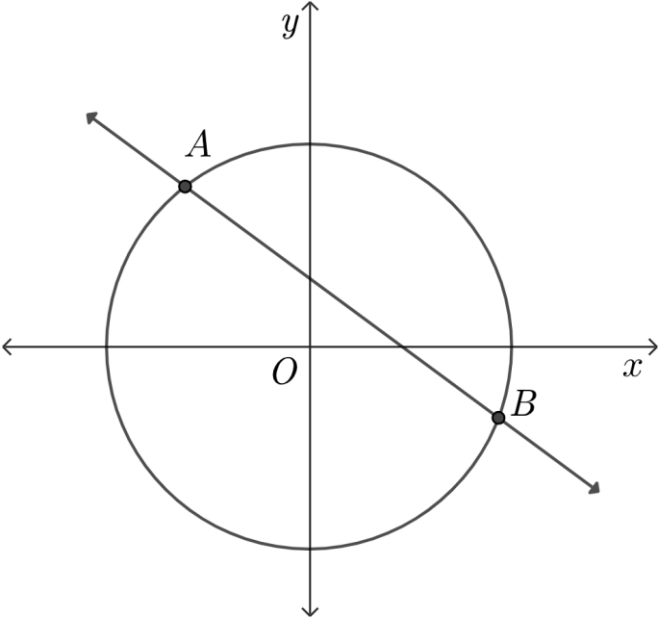
<b>MARKING CODES / NASIENKODES</b>	
<b>M</b>	Method / <i>Metode</i>
<b>A</b>	Accuracy / <i>Akkuraatheid</i>
<b>AO</b>	Answer only / <i>Slegs antwoord</i>
<b>CA</b>	Consistent accuracy / <i>Deurlopende akkuraatheid</i>
<b>F</b>	Formula / <i>Formule</i>
<b>I</b>	Identity / <i>Identiteit</i>
<b>R</b>	Rounding / <i>Afronding</i>
<b>S</b>	Simplification / <i>Vereenvoudiging</i>
<b>ST</b>	Statement / <i>Bewering</i>
<b>RE</b>	Reason / <i>Rede</i>
<b>ST RE</b>	Statement and correct reason / <i>Bewering en korrekte rede</i>
<b>SF</b>	Substitution correctly in correct formula / <i>Korrekte vervanging in die korrekte formule</i>
<b>NPU</b>	No penalty for omitting units / <i>Geen penalisering vir eenhede uitgelaat</i>

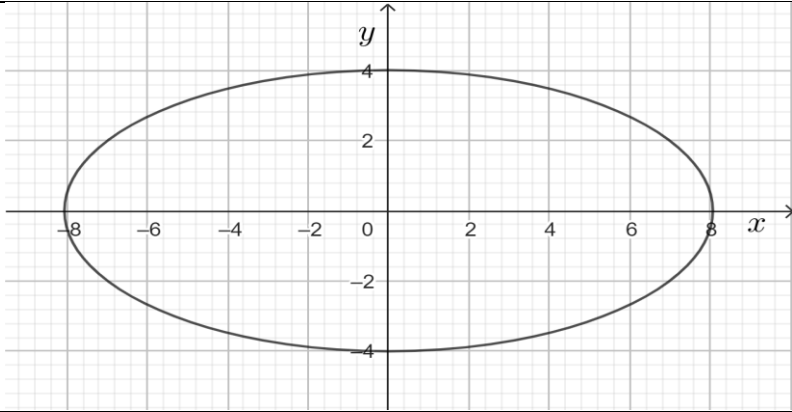
QUESTION/VRAAG 1

			
<p>1.1</p>	$m = \frac{y_2 - y_1}{x_2 - x_1}$ $m_{XY} = \frac{2 + 4}{3 + 2}$ $= \frac{6}{5}$	<p>✓Subst.            A</p> <p>✓Ans/Antw.      CA</p>	<p>(2)</p>
<p>1.2</p>	$XY = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(3 + 2)^2 + (2 + 4)^2}$ $= \sqrt{5^2 + 6^2}$ $= \sqrt{61}$ $= 7,81 \text{ units/eenhede}$	<p>✓F                    A</p> <p>✓Subst.            A</p> <p>✓Ans/Antw.      CA</p>	<p>(3)</p>
<p>1.3</p>	$\tan \theta = m_{XY}$ $\tan \theta = \frac{6}{5}$ $\theta = \tan^{-1}\left(\frac{6}{5}\right)$ $\theta = 50,19^\circ$	<p>✓M                    A</p> <p>✓Subst.            CA</p> <p>✓Ans/Antw.      CA</p>	<p>(3)</p>

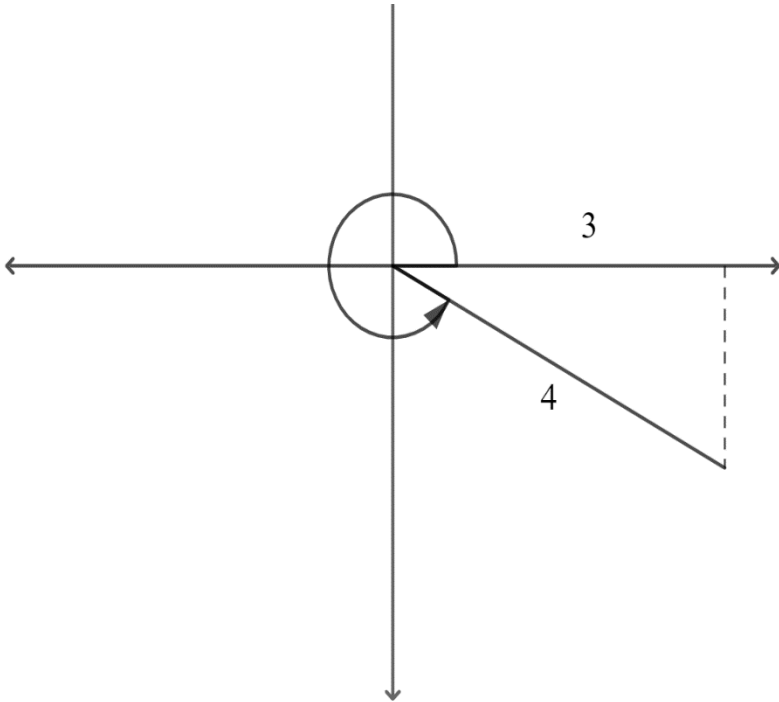
<p>1.4</p>	$M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$ $= M\left(\frac{3 + 7}{2}; \frac{2 + 1}{2}\right)$ $= M\left(5; \frac{3}{2}\right)$ $m_{XY} = \frac{6}{5}$ $y - y_1 = m(x - x_2)$ $y - \frac{3}{2} = \frac{6}{5}(x - 5)$ $y = \frac{6}{5}x - 6 + \frac{3}{2}$ $y = \frac{6}{5}x - \frac{9}{2}$ <p style="text-align: center;"><b>OR/OF</b></p> $M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$ $= M\left(\frac{3 + 7}{2}; \frac{2 + 1}{2}\right)$ $= M\left(5; \frac{3}{2}\right)$ $m_{XY} = \frac{6}{5}$ $y = mx + c$ $\frac{3}{2} = \frac{6}{5}(5) + c$ $\frac{3}{2} - 6 = c$ $c = -\frac{9}{2}$ $y = \frac{6}{5}x - \frac{9}{2}$	<p>✓x-value/waarde A                  ✓y-value/waarde A</p> <p>✓Subst .            CA</p> <p>✓S                    CA</p> <p>✓Ans/Antw.        CA</p> <p>✓x-value/waarde A                  ✓y-value/waarde A</p> <p>✓Subst.            CA</p> <p>✓S                    CA</p> <p>✓Ans/Antw.        CA</p>	<p style="text-align: right;">(5)</p> <p style="text-align: right;"><b>[13]</b></p>
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QUESTION/VRAAG 2

2.1			
2.1.1	Secant/sekant	✓Ans/Antw. A	(1)
2.1.2	$y = -x + 4, \quad x^2 + y^2 = 40$  $x^2 + (-x + 4)^2 = 40$ $x^2 + x^2 - 8x + 16 = 40$ $2x^2 - 8x - 24 = 0$ $x^2 - 4x - 12 = 0$ $(x - 6)(x + 2) = 0$ $x = 6 \text{ or } x = -2$ $y = -6 + 4 \quad y = -(-2) + 4$ $y = -2 \quad y = 6$  $A(-2 ; 6), \quad B(6 ; -2)$	✓Subst. A  ✓Standard Form/Vorm CA  ✓A (-2 ; 6) CA ✓B (6 ; -2) CA	(4)
2.1.3	$x \cdot x_2 + y \cdot y_2 = r^2$ $x(-2) + y(6) = 40$ $-2x + 6y = 40$ $6y = 2x + 40$ $y = \frac{2}{6}x + \frac{40}{6}$ $y = \frac{1}{3}x + \frac{20}{3}$  <p style="text-align: center;"><b>OR/OF</b></p>	✓F A  ✓SF A  ✓S CA  ✓Equation/Vgl. CA	(4)

	$m_{OA} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{6 - 0}{-2 - 0}$ $= -3$ $m_{\text{tangent}} = -1 \times -\frac{1}{3} = \frac{1}{3}$ $y - y_1 = m(x - x_1)$ $y - 6 = \frac{1}{3}(x + 2)$ $y = \frac{1}{3}x + \frac{2}{3} + 6$ $y = \frac{1}{3}x + \frac{20}{3}$	<p>✓ <math>m_{OA}</math>      A</p> <p>✓ <math>m_{\text{tangent}}</math>      CA</p> <p>✓ S      CA</p> <p>✓ Equation/Vgl. CA</p>	(4)
2.2.1	Ellipse/Ellips or/of Oval/Ovaal	✓ Ans/Antw.      A	(1)
2.2.2	$16x^2 + 64y^2 = 1024$ $\frac{16x^2}{1024} + \frac{64y^2}{1024} = \frac{1024}{1024}$ $\frac{x^2}{64} + \frac{y^2}{16} = 1$ $\frac{x^2}{8^2} + \frac{y^2}{4^2} = 1$	<p>✓ M      A</p> <p>✓ Equation/Vgl. CA</p>	(2)
2.2.3		<p>✓ elliptical shape /elliptiese vorm      A</p> <p>✓ x-int/as      A</p> <p>✓ y-int/as      A</p>	(3)
			[15]

QUESTION/VRAAG 3

3.1	$\theta = 22,51^\circ \quad \beta = 231,21^\circ$ $\cos(\theta + 20^\circ) - \tan(3\beta)$ $= \cos(22,51^\circ + 20^\circ) - \tan(3 \times 231,21^\circ)$ $= 1,23$	✓Subst. <b>A</b> ✓Ans/Antw. <b>A</b>	(2)
3.2.1	 <p> <math>x^2 + y^2 = r^2</math>  <math>3^2 + y^2 = 4^2</math>  <math>y^2 = 16 - 9</math>  <math>y = \pm\sqrt{7}</math>  <math>y = -\sqrt{7}</math>  <math>\sin \alpha = \frac{-\sqrt{7}}{4}</math> </p>	✓Diagram <b>A</b>  ✓Subst. <b>CA</b>  ✓y-value/waarde <b>CA</b>  ✓ $\sin \alpha = \frac{-\sqrt{7}}{4}$ <b>CA</b>	(4)

3.2.2	$\tan \alpha + \frac{\operatorname{cosec}^2 \alpha}{3}$ $= \frac{-\sqrt{7}}{3} + \frac{\left(\frac{4}{-\sqrt{7}}\right)^2}{3}$ $= \frac{16 - 7\sqrt{7}}{21}$ $= -0,12$	$\checkmark \tan \alpha = \frac{-\sqrt{7}}{3} \quad \text{CA}$ $\checkmark \operatorname{cosec} \alpha = \frac{4}{-\sqrt{7}} \quad \text{CA}$ $\checkmark \text{Ans/Antw.} \quad \text{CA}$ <p><b>NPR</b></p>	(3)
3.3	$3 \sin x = -2$ $\sin x = \frac{-2}{3}$ $x = \sin^{-1}\left(\frac{2}{3}\right)$ <p>Ref <math>\angle = 41,81^\circ</math></p> <p>3<sup>rd</sup> Quad/3<sup>de</sup> kwadrant  <math>x = 180 + 41,81^\circ</math>  <math>x = 221,81^\circ</math></p> <p>4<sup>th</sup> Quad/4<sup>de</sup> kwadrant  <math>x = 360^\circ - 41,81^\circ</math>  <math>x = 318,18^\circ</math></p>	$\checkmark \sin x = \frac{-2}{3} \quad \text{A}$ $\checkmark \sin^{-1}\left(\frac{2}{3}\right) \quad \text{CA}$ $\checkmark \text{Ref } \angle \quad \text{CA}$ $\checkmark x \text{ in 3}^{\text{rd}} \text{ quad/3}^{\text{de}} \text{ kwadrant} \quad \text{CA}$ $\checkmark x \text{ in 4}^{\text{th}} \text{ Quad/4}^{\text{de}} \text{ kwadrant} \quad \text{CA}$	(5)
			<b>[14]</b>



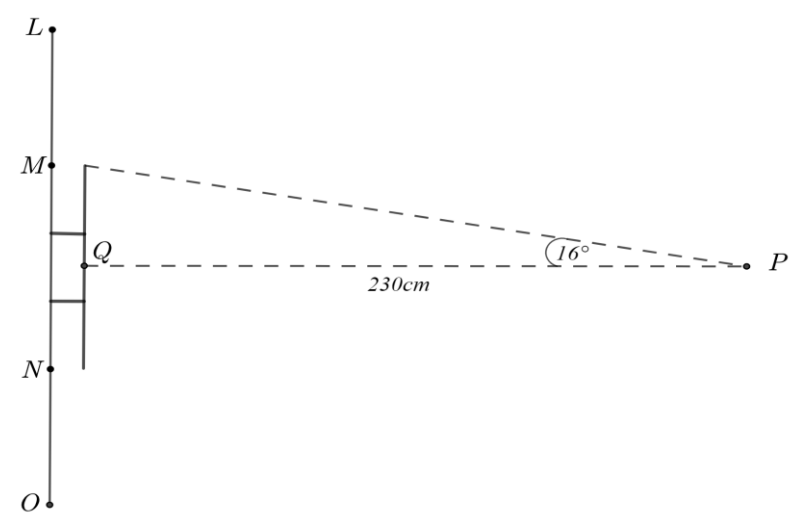
## QUESTION/VRAAG 4

4.1.1	$\cot(2\pi - \theta) = -\cot \theta$ <b>OR / OF</b> $\cot(2\pi - \theta) = -\frac{\cos \theta}{\sin \theta}$	✓ Ans/Antw.      A	(1)
4.1.2	$= \frac{-\tan \theta \cdot \cos \theta \cdot \sin \theta}{\sin \theta \cdot -\frac{\cos \theta}{\sin \theta} \cdot \cos \theta}$ $= \frac{\frac{\sin \theta}{\cos \theta} \cdot \cos \theta}{\frac{1}{\sin \theta}}$ $= \frac{\sin \theta}{\cos \theta} \cdot \cos \theta \cdot \sin \theta$ $= \sin^2 \theta$	✓ $-\tan \theta$ A ✓ $\cos \theta$ A ✓ $\sin \theta$ A ✓ $\frac{1}{\cos \theta}$ A ✓ $\frac{\sin \theta}{\cos \theta}$ A ✓ S      CA ✓ Ans/Antw.      CA	(7)
4.2	$\text{LHS / LK} = \frac{\sin x}{\cos x} \cdot \sin^2 x + \sin x \cdot \cos x$ $= \frac{\sin^3 x}{\cos x} + \sin x \cdot \cos x$ $= \frac{\sin^3 x + \sin x \cdot \cos^2 x}{\cos x}$ $= \frac{\sin x(\sin^2 x + \cos^2 x)}{\cos x}$ $= \frac{\sin x \cdot (1)}{\cos x}$ $= \tan x$ $= \text{RHS / RK}$	✓ $\frac{\sin x}{\cos x}$ A ✓ S      A ✓ Factors/Faktore      A ✓ $\sin^2 x + \cos^2 x = 1$ A ✓ $\frac{\sin \theta}{\cos \theta}$ A	(5)
			<b>[13]</b>

## QUESTION/VRAAG 5

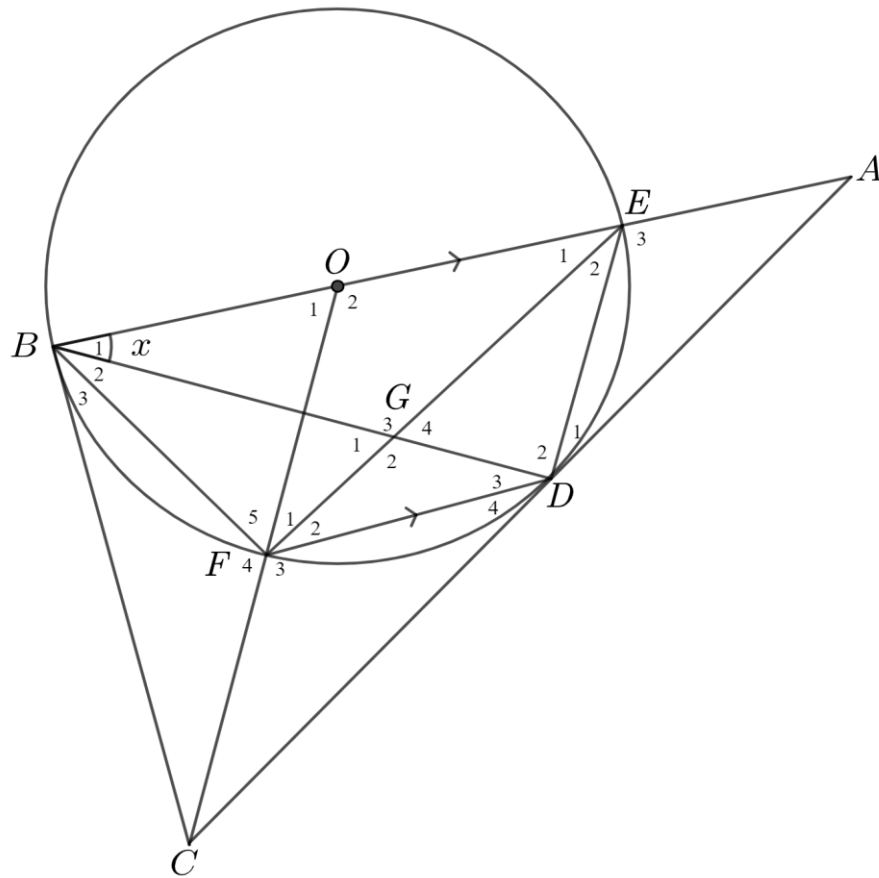
5.1	$f(x) = \tan(x)$ and/en $g(x) = 2 \sin(x + 30^\circ)$ for/vir $x \in (0^\circ; 360^\circ)$		
		$g$ : ✓ $y$ -intercept/as      A ✓ $x$ -intercept/as      A ✓ TP/DP                      A	(3)
5.2.1	$180^\circ$	✓ $180^\circ$ A	(1)
5.2.2	$x = 90^\circ$ and/en $x = 270^\circ$	✓ $x = 90^\circ$ A ✓ $x = 270^\circ$ A	(2)
5.2.3	$y \in [-2; 2]$	✓ values/waardes      A ✓ notation/notasie      A	(2)
5.2.4	Amplitude of/van $g = 2$	✓ Answer/Antwoord A	(1)
5.3	$0^\circ < x < 90^\circ$ , $150^\circ < x < 180^\circ$ , $270^\circ < x < 330^\circ$	✓ $0^\circ < x < 90^\circ$ CA ✓ $150^\circ < x < 180^\circ$ CA ✓ $270^\circ < x < 330^\circ$ CA	(3)
			<b>[12]</b>

QUESTION/VRAAG 6

			
6.1	$\tan \theta = \frac{\text{opposite/teenoorstaande}}{\text{adjacent/aangrensend}}$	✓ Ans/antw. <b>A</b>	(1)
6.2	$\tan 16^\circ = \frac{MQ}{PQ}$ $MQ = PQ \tan 16^\circ$ $= 230 \times \tan 16^\circ$ $= 65,95 \text{ cm}$ $MN = 65,95 \times 2$ $= 131,9 \text{ cm}$ $= 132 \text{ cm}$	✓ $\tan 16^\circ = \frac{MQ}{PQ}$ <b>A</b>  ✓ $MQ$ <b>CA</b>  ✓ $MN$ <b>CA</b> <b>NPR</b>	(3)
6.3	$\text{Area of/Oppervlakte van } \triangle MNP = \left(\frac{1}{2} \times PQ \times MQ\right)$ $= \left(\frac{1}{2} \times 230 \times 65,95\right) \times 2$ $= 15\,168,5 \text{ cm}^2$ <p style="text-align: center;"><b>OR/OF</b></p> $\text{Area} = \frac{1}{2} a \cdot b \sin \hat{C}$ $= \frac{1}{2} PM \times PN \times \sin \hat{P}$ $= \frac{1}{2} \left(\frac{230}{\cos 16^\circ}\right) \left(\frac{230}{\cos 16^\circ}\right) \sin 32^\circ$ $= 15168,83 \text{ cm}^2$	✓ F <b>A</b> ✓ SF <b>CA</b>  ✓ Area/Oppervl. <b>CA</b>  ✓ F <b>A</b> ✓ SF <b>CA</b>  ✓ Area/Oppervl. <b>CA</b> <b>NRP</b>	(3)

6.4.1	$125 \times 15 = 1\,875 \text{ min.}$  $1 \frac{\text{hr}}{\text{uur}} = 60 \text{ min}$  $\frac{1\,875}{60} = 31,25 \frac{\text{hrs}}{\text{ure}}$  $1 \text{ day/dag} = 8 \text{ hrs/ure}$  $\frac{31,25}{8} = 3,90 = 4 \text{ days/dae}$	$\checkmark 1\,875 \text{ min}$ <b>A</b>  $\checkmark 31,25 \text{ hrs/ure}$ <b>CA</b>    $\checkmark 4 \text{ days/dae}$ <b>CA</b>	(3)
6.4.2	$\text{Payment/Betaling} = R350,00 \times 8 \times 4$ $= R11\,200,00$	$\checkmark \text{Payment/Betaling}$ <b>CA</b>	(1)
			<b>[11]</b>

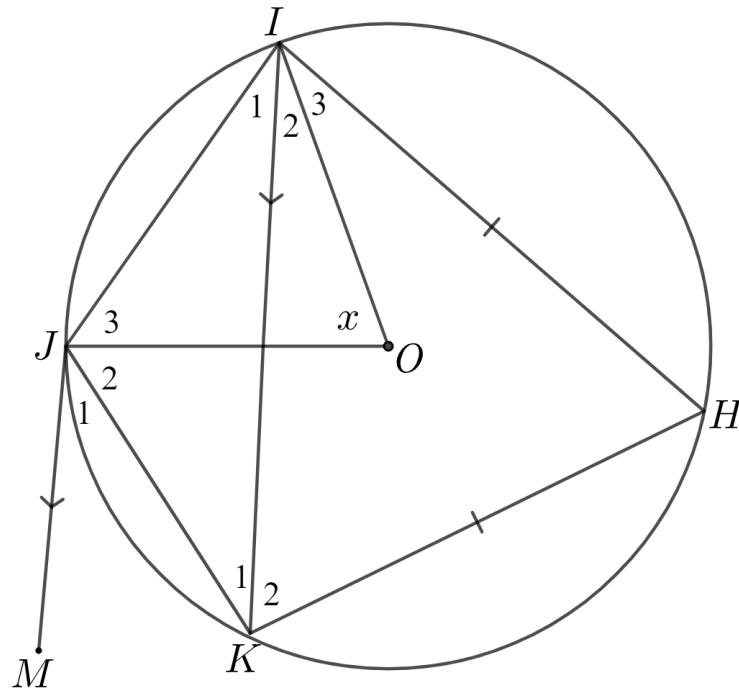
QUESTION/VRAAG 7



7.1	<p>1. <math>\hat{D}_3 = \hat{B}_1 = x</math>, (alt. <math>\angle</math>'s / verw. <math>\angle</math>'e; <math>BA \parallel FD</math>)</p> <p>2. <math>\hat{E}_1 = \hat{D}_3 = x</math> (<math>\angle</math>'s in the same seg./ <math>\angle</math>'e in dieselfde seg.)</p> <p>3. <math>\hat{F}_2 = \hat{E}_1 = x</math> (alt. <math>\angle</math>'s / verw. <math>\angle</math>'e; <math>BA \parallel FD</math>)</p> <p>4. <math>\hat{F}_1 = \hat{E}_1 = x</math> (<math>\angle</math>'s opp = sides/ <math>\angle</math>'e teenoor = sye)</p> <p>5. <math>\hat{F}_1 = \hat{D}_1 = x</math> (tan chord/raaklyn koord)</p>	<p>✓ ST ✓ RE    A</p> <p>✓ ST ✓ RE    A</p> <p>✓ ST ✓ RE    A</p>	(6)
7.2	<p><math>O\hat{B}C = 90^\circ</math> tan <math>\perp</math> rad</p> <p><math>B\hat{F}E = 90^\circ</math></p> <p><b>OR / OF</b></p> <p><math>B\hat{D}E = 90^\circ</math></p>	<p>✓ RE    A</p> <p>✓ <math>B\hat{F}E</math>    A</p>	(2)

7.3	$D\hat{B}O + B\hat{D}A + \hat{A} = 180^\circ$ (int. $\angle$ 's of $\Delta$ /binne $\angle$ 'e van $\Delta$ ) $x + (90^\circ + x) + \hat{A} = 180^\circ$ $\hat{A} = 180^\circ - (90^\circ + 2x)$ $\hat{A} = 90^\circ - 2x$ $\hat{A} = 90^\circ - 2(23^\circ)$ $= 44^\circ$	$\checkmark$ ST $\checkmark$ RE <b>A</b>  $\checkmark$ S <b>CA</b>  $\checkmark$ Subst. <b>A</b>  $\checkmark$ Ans/ <i>Antw.</i> <b>CA</b>	(5)
			<b>[13]</b>

QUESTION/VRAAG 8

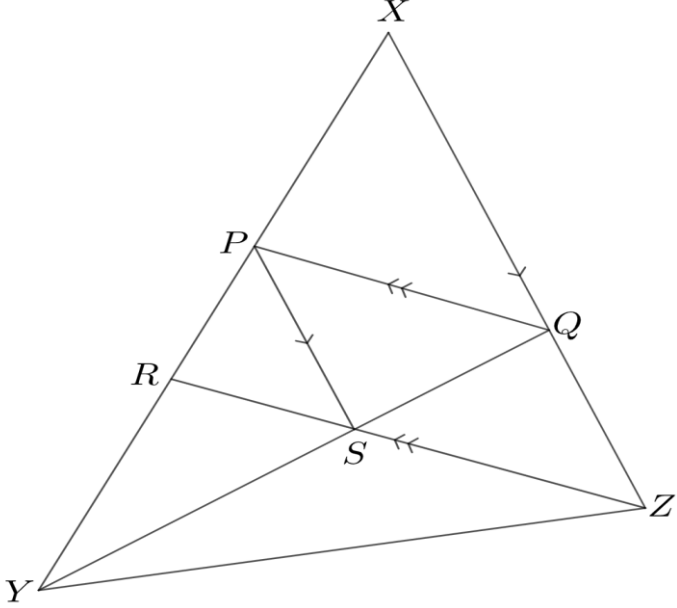


8.1	$\hat{O} = 2\hat{K}_1$ ( $\angle$ at centre = $2 \times \angle$ at circumf / midpts $\leq 2 \times$ omtreks $\angle$ ) $\hat{K}_1 = \frac{x}{2}$	✓ RE      A ✓ ST      A	(2)
8.2.1	$\hat{K}_1 = \hat{J}_1$ (alt. $\angle$ 's / verw. $\angle$ 'e; $JM \square IM$ ) $\hat{J}_1 = \hat{I}_1$ (tan - chord/raaklyn koord) $\therefore JK = JI$ (sides opp = $\angle$ 's/sye teenoor = $\angle$ 'e)	✓ ST      A ✓ RE      A ✓ RE      A	(4)
8.2.2	$\hat{K}_1 = \hat{J}_1 = \frac{x}{2}$ (alt. $\angle$ 's/verw. $\angle$ 'e; $JM \square IM$ ) $\hat{I}_1 = \hat{J}_1$ (proved/bewys) $\hat{J}_{2+3} = 180^\circ - (\hat{K}_1 + \hat{I}_1)$ (int $\angle$ 's of $\Delta$ / binne $\angle$ 'e van $\Delta$ ) $= 180^\circ - x$ $\therefore \hat{H} + J = 180^\circ$ (opp $\angle$ 's of cq/teenoorst. $\angle$ 'e van kvh) $\hat{H} = 180^\circ - (180^\circ - x)$ $\hat{H} = x$	✓ RE      A ✓ $180^\circ - x$ CA ✓ RE      A ✓ H      CA	(3)

8.3	$\hat{O} = \hat{H} = x$ (proved/bewys)  <i>in</i> $\triangle IHK$ $\hat{I}K\hat{H} = \hat{K}\hat{I}\hat{H}$ ( $\hat{<'s opp = sides/ <'e teenoor = sye$ ) $\hat{K}_2 = \frac{180^\circ - x}{2}$ (int. $\hat{<'s of \Delta / binne <'e van \Delta$ )  <i>in</i> $\triangle IOJ$ $\hat{I}\hat{J}\hat{O} = \hat{J}\hat{I}\hat{O}$ ( $\hat{<'s opp = sides/ <'e teenoor = sye$ ) $\hat{J}_3 = \frac{180^\circ - x}{2}$ (int. $\hat{<'s of \Delta / binne <'e van \Delta$ ) $\therefore \hat{J}_3 = \hat{K}_2$ $\hat{I}_{1+2} = \hat{I}_{2+3}$ (third $\hat{< of \Delta / derde < van \Delta$ )  $\triangle IOJ \parallel \triangle IHK$ ( $\angle\angle\angle$ )	✓ ST      A   ✓ ST      A  ✓ RE      A	(4)
8.4	$\frac{HK}{OJ} = \frac{IK}{IJ}$ $\triangle IOJ \parallel \triangle IHK$ $\angle\angle\angle$ $\frac{10}{5} = \frac{8}{IJ}$  $IJ = \frac{8 \times 5}{10}$  $IJ = 4cm$	✓ ST   ✓ RE      A  ✓ Subst.      CA  ✓ S      CA	(5)
			<b>[18]</b>



QUESTION/VRAAG 9

9.1	Parallel/eweredig	✓ ST      A	(1)
9.2			
9.2.1	<p>In <math>\triangle YPQ</math>  <math>\frac{YR}{RP} = \frac{YS}{SQ}</math>      (<math>SR \parallel QP</math>)</p> <p>In <math>\triangle YXQ</math>  <math>\frac{YP}{PX} = \frac{YS}{SQ}</math>      (<math>PS \parallel XQ</math>)</p> <p><math>\therefore \frac{YR}{RP} = \frac{YP}{PX}</math></p>	<p>✓ ST ✓ RE      A</p> <p>✓ ST      A</p>	(3)
9.2.2	<p>In <math>\triangle YXQ</math>  <math>\frac{XY}{PY} = \frac{QY}{SY}</math>      (<math>XQ \parallel PS</math>)</p> <p>In <math>\triangle YPQ</math>  <math>\frac{PY}{RY} = \frac{QY}{SY}</math>      (<math>SR \parallel QP</math>)</p> <p><math>\therefore \frac{XY}{PY} = \frac{PY}{RY}</math></p> <p><math>XY \cdot RY = PY^2</math></p>	<p>✓ ST ✓ RE      A</p> <p>✓ ST      A</p> <p>✓ S      CA</p>	(4)
			<b>[8]</b>

QUESTION/VRAAG 10			
10.1.1	$50 \text{ mm} = \frac{50 \text{ mm}}{1} \times \frac{1 \text{ m}}{1\,000 \text{ mm}} = \frac{1}{20} \text{ m} = 0,05 \text{ m}$	✓ conv/herleid      A ✓ ans/antw          CA <b>NPU, NPR</b>	(2)
10.1.2	$\frac{8000}{1 \text{ min}} \times \frac{1}{60 \text{ sec}} = \frac{400}{3} \text{ rev/s} \approx 133,33 \text{ rev/s}$	✓ conv/herleid      A ✓ ans/antw          CA <b>NPU, NPR</b>	(2)
10.1.3	$\omega = 2\pi n$ $\omega = 2\pi(133,33)$ $\omega \approx 266,67\pi \text{ rad/s}$ <p style="text-align: center;"><b>OR/OF</b></p> $\omega \approx 837,75 \text{ rad/s}$	✓ F                      A ✓ SF                    CA ✓ Ans/antw          CA	(3)
10.1.4	$v = \pi Dn$ $v = \pi(0,05)(133,33)$ $v = 6,67\pi \text{ m/s}$ $v = 20,94 \text{ m/s}$	✓ F                      A ✓ SF                    CA ✓ Ans/antw.        CA  ✓ unit/eenhede    A	(4)
10.2.1	$38^\circ \times \frac{\pi}{180^\circ} = \frac{19\pi}{90} \text{ rad}$ $\approx 0,66 \text{ rad}$	✓ Ans/antw.        A <b>NPU, NPR</b>	(1)
10.2.2	$s = r\theta$ $r = \frac{s}{\theta} = \frac{15}{\left(\frac{19\pi}{90}\right)}$ $OP = 22,62 \text{ m}$	✓ F                      A  ✓ SF                    CA  ✓ Ans/antw.        CA	(3)
10.2.3	$\text{Area of sector } OPQ = \frac{1}{2} r^2 \theta$ $= \frac{1}{2} \times (22,62)^2 \times \left(\frac{19\pi}{90}\right)$ $= 169,67 \text{ m}^2$  <p style="text-align: center;"><b>OR/OF</b></p>	✓ F                      A  ✓ SF                    CA  ✓ Area/Oppervl.    CA  <b>NPU, NPR</b> <b>AO Full marks</b>	

	$\text{Area of sector/van sektor } OPQ = \frac{rs}{2}$ $= \frac{22,62 \times 15}{2}$ $= 169,65 \text{ m}^2$	✓F                    A ✓SF                   CA ✓Area/Oppervl. CA NPU, NPR AO Full marks	(3)
10.3	$4h^2 - 4dh + x^2 = 0$ $h = 5\text{cm}, d = 23\text{cm}$ $4(5)^2 - 4(23)(5) + x^2 = 0$ $x^2 = 460 - 100$ $x^2 = 360$ $x = \pm\sqrt{360}$ $x = 18,97\text{cm}$	✓F                    A ✓SF                   CA ✓S                     CA ✓Ans/Antw.        A	(4)
			[22]

QUESTION/VRAAG 11			
11.1			
	$A_T = a \left( \frac{o_1 + o_7}{2} + o_2 + o_3 + o_4 + o_5 + o_6 \right)$ $= \frac{36}{6} \left( \frac{8 + 8,5}{2} + 7,35 + 6,21 + 8,1 + 7,5 + 6,8 \right)$ $= 6 \left( \frac{4\,421}{100} \right)$ $= 265,26 \text{ m}^2$ <p style="text-align: center;"><b>OR/OF</b></p> $A_T = a(m_1 + m_2 + m_3 + m_4 + \dots + m_n)$ $= \frac{36}{6} \left( \frac{8+7,35}{2} + \frac{7,35+6,21}{2} + \frac{6,21+8,1}{2} + \frac{8,1+7,5}{2} + \frac{7,5+6,8}{2} + \frac{6,8+8,5}{2} \right)$ $= 6 \left( \frac{4\,421}{100} \right)$ $= 265,26 \text{ m}^2$	<p>✓F            A</p> <p>✓SF            A</p> <p>✓<math>a = \frac{36}{6}</math>        A</p> <p>✓S CA ✓Area/Oppervl. CA</p> <p>✓F            A</p> <p>✓SF            A</p> <p>✓<math>a = \frac{36}{6}</math>        A</p> <p>✓S            CA</p> <p>✓Area/Oppervl. CA    (5)</p>	
11.2.1	<p>Area of rectangular prism/ oppervlakte van reghoekige prisma = <math>2lh + 2lw + 2wh</math>  <math>1\,790 = (50 \times x) + 2(8 \times x) + 2(8 \times 50)</math> (one side is open/een kant is oop)  <math>1\,790 = 50x + 16x + 800</math>  <math>66x = 1\,790 - 800</math>  <math>x = \frac{990}{66}</math>  <math>x = 15 \text{ cm}</math></p>	<p>✓SF            A</p> <p>✓S            CA  ✓value of/waarde van x        CA    (3)</p>	

11.2.2	Volume of cylinder = $\pi r^2 h$ Vol. of/van $\frac{1}{4}$ circle/sirkel = $\frac{1}{4} \pi r^2 h$ $= \frac{1}{4} \times \pi \times (15)^2 \times 50$ $= 8\,835,72 \text{ cm}^3$	✓F                    A  ✓Subst.            CA  ✓Ans/Antw.      CA	(3)
			<b>[11]</b>
		<b>TOTAL /TOTAAL:</b>	<b>150</b>