



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
*NASIONALE
SENIOR SERTIFIKAAT***

GRADE/*GRAAD* 10

MATHEMATICS P2/*WISKUNDE V2*

NOVEMBER 2018

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

**These marking guidelines consist of 13 pages.
*Hierdie nasienriglyne bestaan uit 13 bladsye.***

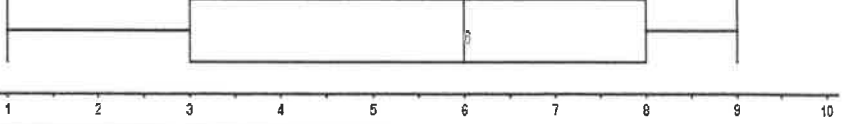
NOTE:

- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:

- As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.
- Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.
- Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.

QUESTION/VRAAG 1

1.1	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Marks/Punte</th> <th style="width: 50%;">Frequency/Frekwensie</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">7</td><td style="text-align: center;">7</td></tr> <tr><td style="text-align: center;">8</td><td style="text-align: center;">9</td></tr> <tr><td style="text-align: center;">9</td><td style="text-align: center;">5</td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">0</td></tr> </tbody> </table>	Marks/Punte	Frequency/Frekwensie	0	0	1	3	2	4	3	5	4	3	5	6	6	0	7	7	8	9	9	5	10	0	<p>2 marks: all 11 values correct</p> <p>1 mark: 5 – 10 values correct</p> <p>0 marks: 0 – 4 values correct</p> <p style="text-align: right;">(2)</p>
Marks/Punte	Frequency/Frekwensie																									
0	0																									
1	3																									
2	4																									
3	5																									
4	3																									
5	6																									
6	0																									
7	7																									
8	9																									
9	5																									
10	0																									
1.2	42 learners/leerders	✓ answer/antwoord (1)																								
1.3.1	Range/Variasiewydte $= 9 - 1$ $= 8$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 100px;">Answer only: 2/2 marks</div>	✓ max = 9 and min = 1 ✓ answer/antwoord (2)																								
1.3.2	$\bar{x} = \frac{(1 \times 3) + (2 \times 4) + (3 \times 5) + (4 \times 3) + (5 \times 6) + (7 \times 7) + (8 \times 9) + (9 \times 5)}{42}$ $= \frac{234}{42}$ $= 5,57$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 100px;">Answer only: 3/3 marks</div>	✓ sum of (frequencies × values) ✓ ÷ n ✓ answer/antwoord (3)																								
1.4	Position of the median/Posisie van die mediaan = $\frac{n+1}{2}$ $= 21,5^{th/de}$ position/posisie $Q_2 = \frac{5+7}{2}$ $= 6$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 100px;">Answer only: 3/3 marks</div>	✓ identification of 5 and 7 ✓ $\frac{5+7}{2}$ ✓ answer/antwoord (3)																								
1.5		✓ Q ₁ ✓ Q ₃ ✓ rest of the box (3)																								
		[14]																								

QUESTION/VRAAG 2

<p>2.1.1</p>	$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(1 - 6)^2 + (0 - 3)^2}$ $= \sqrt{25 + 9}$ $= \sqrt{34}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Answer only: 2/2 marks</div>	<p>✓ subst./verv.</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(2)</p>
<p>2.1.2</p>	$m_{PQ} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3 - 0}{6 - 1}$ $= \frac{3}{5}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Answer only: 2/2 marks</div>	<p>✓ subst./verv.</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(2)</p>
<p>2.1.3</p>	$x_T = \frac{x_1 + x_2}{2}$ $= \frac{1 + 6}{2}$ $= \frac{7}{2}$ $T\left(\frac{7}{2}; \frac{3}{2}\right)$ $y_T = \frac{y_1 + y_2}{2}$ $= \frac{0 + 3}{2}$ $= \frac{3}{2}$	<p>✓ x-value/x-waarde</p> <p>✓ y-value/y-waarde</p> <p style="text-align: right;">(2)</p>
<p>2.2.1</p>	$QR = QP = \sqrt{34}$ $QT = \frac{1}{2}PQ$ <p style="text-align: center;">OR/OF</p> $QT = \frac{1}{2}\sqrt{34}$ $QT = \sqrt{\left(\frac{7}{2} - 6\right)^2 + \left(\frac{3}{2} - 3\right)^2}$ $QT = \frac{\sqrt{34}}{2}$ $\text{Area of } \Delta QTR = \frac{1}{2}(QR)(QT)$ $= \frac{1}{2}(\sqrt{34})\left(\frac{1}{2}\sqrt{34}\right)$ $= \frac{17}{2} = 8,5 \text{ sq units/eenhede}$ <p>OR/OF</p>	<p>✓ $QR = \sqrt{34}$</p> <p>✓ $QT = \frac{1}{2}\sqrt{34}$</p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(3)</p>

	$QR = QP = \sqrt{34}$ $\text{Area of } \Delta QTR = \frac{1}{2} \text{Area of } \Delta QPR$ $= \frac{1}{2} \left(\frac{1}{2} \cdot QR \cdot QP \right)$ $= \frac{1}{2} \times \frac{1}{2} \cdot (\sqrt{34}) (\sqrt{34})$ $= \frac{17}{2} \text{ sq units/eenhede}$	<p>✓ $QR = \sqrt{34}$</p> <p>✓ $\frac{1}{2} \sqrt{34}$</p> <p>✓ answer/antwoord (3)</p>
<p>2.2.2</p>	$\theta = 121^\circ - 90^\circ \quad (\text{ext } \angle \Delta / \text{buitehoek van } \Delta)$ $= 31^\circ$ <p>OR/OF</p> $\widehat{QSP} = 59^\circ \quad (\angle \text{ str line/hoek op reguitlyn})$ $\theta = 31^\circ \quad (\angle \text{ sum } \Delta / \text{binnehoek van } \Delta)$	<p>✓ reason</p> <p>✓ answer/antwoord (2)</p> <p>✓ \angle sum Δ / binnehoek van Δ</p> <p>✓ answer/antwoord (2)</p>
<p>2.2.3</p>	$\cos \theta = \frac{PQ}{PS} \qquad \sin \widehat{QSP} = \frac{PQ}{PS}$ $\cos 31^\circ = \frac{\sqrt{34}}{PS} \qquad \sin 59^\circ = \frac{\sqrt{34}}{PS}$ <p style="text-align: center;">OR/OF</p> $PS = \frac{\sqrt{34}}{\cos 31^\circ} \qquad PS = \frac{\sqrt{34}}{\sin 59^\circ}$ $PS = 6,80 \qquad PS = 6,80$ <p>S(6,8 + 1; 0)</p> <p>S(7,8; 0)</p> <p>OR/OF</p> $m_{QR} = -\frac{5}{3}$ $\frac{3-0}{6-x} = -\frac{5}{3}$ $9 = -30 + 5x$ $x = 7,8$ <p>OR/OF</p> $m_{QR} = -\frac{5}{3}$ <p>Equation of QR</p> $y - 3 = -\frac{5}{3}(x - 6)$ $y = -\frac{5}{3}x + 13$ $0 = -\frac{5}{3}x + 13$ $x = 7,8$ <p>S(7,8; 0)</p>	<p>✓ $\cos \theta = \frac{PQ}{PS}$ or/of</p> <p>$\sin \widehat{QSP} = \frac{PQ}{PS}$</p> <p>✓ x-value/x-waarde</p> <p>✓ y-value/y-waarde (3)</p> <p>✓ $m_{QR} = m_{QS}$</p> <p>✓ $y = 0$</p> <p>✓ x-value/x-waarde (3)</p> <p>✓ equation of QR/verhouding van QR</p> <p>✓ $y = 0$</p> <p>✓ x-value/x-waarde</p>

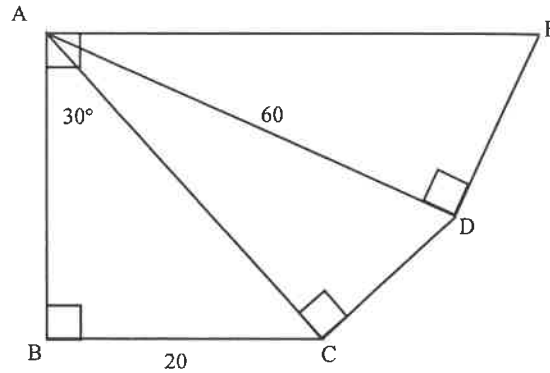
		(3)
2.3	$m_{QR} = \frac{3 - (-2)}{6 - (9)}$ $= -\frac{5}{3}$ $m_{T\text{-midpoint}} = m_{QR} \text{ (Midpoint Theorem)}$ $m_{T\text{-midpoint}} = -\frac{5}{3}$ <p>OR/OF</p> $\text{Midpoint PR} \left(\frac{9+1}{2}; \frac{-2+0}{2} \right)$ $\text{Midpoint PR}(5; -1)$ $m_{T \text{ and/en } PR} = \frac{\frac{3}{2} - (-1)}{\frac{7}{2} - (5)}$ $= -\frac{5}{3}$	<p>✓ m_{QR}</p> <p>✓ $m_{T\text{-midpoint}} = m_{QR}$</p> <p>✓ Midpoint theorem/ Middelpunt-stelling (3)</p> <p>✓ midpoint of PR</p> <p>✓ subst</p> <p>✓ answer (3)</p>
		[17]

QUESTION/VRAAG 3

3.1.1	$\tan(90^\circ - R) = \frac{PR}{QP}$ OR/OF $\frac{q}{r}$	<p>✓ answer/antwoord (1)</p>
3.1.2	<p>sec Q</p> <p>OR/OF</p> <p>cosec R</p> <p>OR/OF</p> <p>cosec (90° – Q)</p> <p>OR/OF</p> <p>sec (90° – R)</p>	<p>✓ answer/antwoord (1)</p> <p>✓ answer/antwoord (1)</p> <p>✓ answer/antwoord (1)</p> <p>✓ answer/antwoord (1)</p>
3.2.1	$OS = \sqrt{(-3)^2 + (-4)^2}$ (Pythagoras) = 5 <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">Answer only: 2/2 marks</div>	<p>✓ subst./verv.</p> <p>✓ answer/antwoord (2)</p>

<p>3.2.2</p>	$\sec\theta + \sin^2\theta$ $= -\frac{5}{3} + \left(-\frac{4}{5}\right)^2$ $= -\frac{5}{3} + \frac{16}{25}$ $= -\frac{77}{75}$	<p>✓ $-\frac{5}{3}$</p> <p>✓ $-\frac{4}{5}$</p> <p>✓ answer/antwoord (3)</p>
<p>3.3</p>	$\frac{\operatorname{cosec} 45^\circ}{\sin 90^\circ \cdot \tan 60^\circ}$ $= \frac{1}{\sin 45^\circ}$ $= \frac{1}{(1) \cdot (\sqrt{3})}$ $= \frac{2}{\sqrt{2}} \div \sqrt{3}$ $= \frac{2}{\sqrt{2}} \times \frac{1}{\sqrt{3}}$ $= \frac{2}{\sqrt{6}}$ <p>OR/OF</p> $\frac{\operatorname{cosec} 45^\circ}{\sin 90^\circ \cdot \tan 60^\circ}$ $= \frac{1}{\sin 45^\circ}$ $= \frac{1}{(1) \cdot (\sqrt{3})}$ $= \frac{\sqrt{2}}{\sqrt{3}}$ <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>If the answer is left as $\frac{\sqrt{6}}{3}$ and no other rationalisation working is shown: max 3/4 marks</p> </div>	<p>✓ $\frac{2}{\sqrt{2}}$</p> <p>✓ 1</p> <p>✓ $\sqrt{3}$</p> <p>✓ answer/antwoord (4)</p> <p>✓ $\sqrt{2}$</p> <p>✓ 1</p> <p>✓ $\sqrt{3}$</p> <p>✓ answer/antwoord (4)</p>
<p>[11]</p>		

QUESTION/VRAAG 4



<p>4.1.1</p>	$\sin 30^\circ = \frac{20}{AC}$ $AC = \frac{20}{\sin 30^\circ}$ $AC = 40$ <p>OR/OF</p> $\cos 60^\circ = \frac{20}{AC}$ $AC = \frac{20}{\cos 60^\circ}$ $AC = 40$	$\text{cosec } 30^\circ = \frac{AC}{20}$ $AC = \frac{20}{\sin 30^\circ}$ $AC = 40$ <p>OR/OF</p> $\sec 60^\circ = \frac{AC}{20}$ $AC = \frac{20}{\cos 60^\circ}$ $AC = 40$	$\checkmark \sin 30^\circ = \frac{20}{AC} \text{ or}$ $\text{cosec } 30^\circ = \frac{AC}{20}$ <p>\checkmark answer/antwoord (2)</p> $\checkmark \cos 60^\circ = \frac{20}{AC} \text{ or}$ $\sec 60^\circ = \frac{AC}{20}$ <p>\checkmark answer/antwoord (2)</p>
<p>4.1.2</p>	$\cos \hat{CAD} = \frac{AC}{60}$ $\cos \hat{CAD} = \frac{40}{60}$ $\hat{CAD} = 48,19^\circ$	$\checkmark \cos \hat{CAD} = \frac{AC}{60}$ <p>\checkmark answer/antwoord (2)</p>	$\checkmark \cos \hat{CAD} = \frac{AC}{60}$ <p>\checkmark answer/antwoord (2)</p>
<p>4.1.3</p>	$\hat{DAE} = 90^\circ - (30^\circ + \hat{CAD})$ $\hat{DAE} = 90^\circ - (30^\circ + 48,19^\circ)$ $= 11,81^\circ$ $\tan 11,81^\circ = \frac{DE}{60}$ $DE = 60 \tan 11,81^\circ$ $DE = 12,55$	$\checkmark \hat{DAE} = 11,8^\circ$ $\checkmark \tan 11,81^\circ = \frac{DE}{60}$ <p>\checkmark answer/antwoord (3)</p>	$\checkmark \hat{DAE} = 11,8^\circ$ $\checkmark \tan 11,81^\circ = \frac{DE}{60}$ <p>\checkmark answer/antwoord (3)</p>

4.2.1	$\tan x = 2,01$ $x = 63,5^\circ$	If the rounding is incorrect: max 1/2 marks	$\checkmark\checkmark$ answer/antwoord (2)
4.2.2	$5 \cos x + 2 = 4$ $5 \cos x = 2$ $\cos x = \frac{2}{5}$ $x = 66,4218\dots^\circ$ $x = 66,4^\circ$		$\checkmark 5 \cos x = 2$ $\checkmark \cos x = \frac{2}{5}$ \checkmark answer/antwoord (3)
4.2.3	$\frac{\operatorname{cosec} x}{2} = 3$ $\operatorname{cosec} x = 6$ $\frac{1}{\sin x} = 6$ $\sin x = \frac{1}{6}$ $x = 9,6^\circ$		$\checkmark \operatorname{cosec} x = 6$ $\checkmark \sin x = \frac{1}{6}$ \checkmark answer/antwoord (3)
			[15]

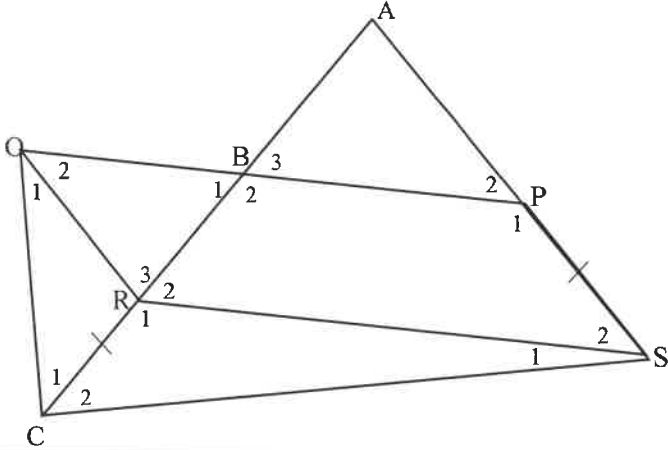
QUESTION/VRAAG 5

5.1.1		<ul style="list-style-type: none"> ✓ Tan graph passing through (45°; -3) or (135°; 3) or (225°; -3) or (315°; 3) ✓ x-intercepts/ x-snyppunte ✓ both asymptotes/ albei asimptote <p style="text-align: right;">(3)</p>
5.1.2(a)	180°	✓ answer/antwoord (1)
5.1.2(b)	$h(x) = 3 \tan x$	✓ answer/antwoord (1)
5.2.1	$a = -2$ $b = 1$	✓ a ✓ b (2)
5.2.2	$90^\circ < x < 270^\circ$ OR/OF $x \in (90^\circ ; 270^\circ)$	✓ answer/antwoord (1)
5.2.3	$-4 \leq y \leq 0$ OR/OF $y \in [-4 ; 0]$	✓ critical values/kritieke waardes ✓ notation/notasie (2)
5.2.4	$-2(\cos 0^\circ + \cos 1^\circ + \cos 2^\circ + \dots + \cos 358^\circ + \cos 359^\circ + \cos 360^\circ)$ $= -2(1)$ $= -2$	✓✓ answer/antwoord (2)
		[12]

QUESTION/VRAAG 6

6.1	$r = 3 \text{ cm}$ $V = \pi r^2 h$ $117\pi = \pi(3)^2 h$ $h = 13 \text{ cm}$	<ul style="list-style-type: none"> ✓ $r = 3 \text{ cm}$ ✓ subst./verv. ✓ answer/antwoord <p style="text-align: right;">(3)</p>
6.2	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> TSA/TBO $= \pi r^2 + 2\pi r h$ $= \pi(3)^2 + 2\pi(3)(13) \times 0,8$ $= 224,31 \text{ cm}^2$ </div> <div style="width: 10%; text-align: center;">OR/OF</div> <div style="width: 45%;"> TSA/TBO $= \pi r^2 + 2\pi r h$ $= \pi(3)^2 + 2\pi(3)(10,4)$ $= 224,31 \text{ cm}^2$ </div> </div>	<ul style="list-style-type: none"> ✓ $\pi r^2 + 2\pi r h$ ✓ subst./verv. ✓ 80% of height/van hoogte ✓ answer <p style="text-align: right;">(4)</p>
		[7]

QUESTION/VRAAG 7

7.1	Bisects the third side/ <i>Halveer die derde sy</i>	✓ answer/ <i>antwoord</i> (1)
7.2		
7.2.1	$CR = PS$ (given) $PS = QR$ (opp sides //m =) $CR = QR$ $\hat{Q}_1 = \hat{C}_1 = 50^\circ$ (\angle s opp = sides) $\hat{R}_3 = 100^\circ$ (ext $\angle \Delta$) $\hat{A} = 100^\circ$ (alt \angle s; $QR \parallel AS$)	✓ $CR = QR$ ✓ $\hat{Q}_1 = \hat{C}_1 = 50^\circ$ ✓ $\hat{R}_3 = 100^\circ$ ✓ $\hat{A} = 100^\circ$ ✓ Reason (5)
7.2.2	$AP = PS$ (line from midpoint // to one side of triangle) $RS = 120$ (midpoint theorem) $QP = 120$ (opp sides //m =) OR/OF <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Answer only: 1/3 marks</div> In ΔQBR and ΔPBA 1. $\hat{R}_3 = \hat{A}$ (proven) or (alt \angle s; $QR \parallel QS$) 2. $\hat{B}_1 = \hat{B}_3$ (vert opp \angle s) 3. $BR = BA$ (given) $\Delta QBR \equiv \Delta PBA$ ($\angle \angle S$) $QB = BP = 60$ ($\equiv \Delta$ s) $QP = 120$	✓ $AP = PS$ ✓ Reason ✓ $QP = 120$ (3) ✓ $\Delta QBR \equiv \Delta PBA$ ✓ $QB = BP$ ✓ $QP = 120$ (3)
		[9]

QUESTION/VRAAG 8		
8.1.1	<p> $AB = DC$ $AE + EB = DF + FC$ (opp sides of a parallelogram equal) $AE = FC$ (given) $\therefore EB = DF$ $DF \parallel EB$ (opp sides parallelogram parallel) $EDFB$ is a parallelogram (one pair opp sides = and \parallel) $\therefore ED \parallel FB$ $\therefore DJ \parallel BK$ </p> <p>OR/OF</p> <p>In $\triangle AED$ and $\triangle CFB$</p> <ol style="list-style-type: none"> 1. $FC = AE$ (given) 2. $\hat{C}_1 + \hat{C}_2 = \hat{A}_1 + \hat{A}_2$ (opp $\angle \parallel m =$) 3. $BC = AD$ (opp sides $\parallel m =$) <p>$\triangle AED \equiv \triangle CFB$ (S\angleS)</p> <p>$\hat{E}_3 = \hat{F}_3$ ($\equiv \Delta s$)</p> <p>$\hat{E}_3 = \hat{D}_1$ (alt $\angle s$; $AB \parallel DC$)</p> <p>$\hat{F}_3 = \hat{D}_1$</p> <p>$DJ \parallel BK$ (corres $\angle s =$)</p>	<p> \checkmark S/R \checkmark $EB = DF$ \checkmark S/R \checkmark R \checkmark $ED \parallel FB$ </p> <p style="text-align: right;">(5)</p> <p> \checkmark $\triangle AED \equiv \triangle CFB$ \checkmark $\hat{E}_3 = \hat{F}_3$ \checkmark S/R \checkmark $\hat{F}_3 = \hat{D}_1$ \checkmark R </p> <p style="text-align: right;">(5)</p>

	<p>OR/OF In $\triangle AED$ and $\triangle CFB$ 1. $FC = AE$ (given) 2. $\widehat{C}_1 + \widehat{C}_2 = \widehat{A}_1 + \widehat{A}_2$ (opp \angle m =) 3. $BC = AD$ (opp sides m =) $\triangle AED \equiv \triangle CFB$ (S\angleS) $DE = FB$ ($\equiv \Delta$s) $AB = DC$ $AE + EB = DF + FC$ (opp sides of a parallelogram equal) $AE = CF$ (given) $\therefore EB = DF$ EDFB is a parallelogram (both pairs opp sides =) $DE \parallel FB$ (opp sides m) $DJ \parallel KB$</p>	<p>✓ $\triangle AED \equiv \triangle CFB$ ✓ $DE = FB$ ✓ S/R ✓ $EB = DF$ ✓ Reason</p>
<p>8.1.2</p>	<p>$\widehat{E}_1 = \widehat{D}_1$ (corres. \angle's, $AB \parallel DC$) $\widehat{F}_1 = \widehat{D}_1$ (alt. \angle's, $DE \parallel FB$) $\therefore \widehat{E}_1 = \widehat{F}_1$</p> <p>OR/OF $\widehat{E}_3 = \widehat{D}_1$ (alt. \angle's, $AB \parallel DC$) $\widehat{F}_1 = \widehat{D}_1$ (alt. \angle's, $DE \parallel FB$) $\therefore \widehat{E}_3 = \widehat{F}_1$ $\widehat{E}_3 = \widehat{E}_1$ (vert. opp. \angle's) $\therefore \widehat{E}_1 = \widehat{F}_1$</p> <p>OR/OF $\widehat{E}_1 = \widehat{D}_1$ (corres \angle's, $AB \parallel DC$) $\widehat{F}_3 = \widehat{D}_1$ (corres \angle's, $DE \parallel FB$) $\therefore \widehat{E}_3 = \widehat{F}_1$ $\widehat{F}_3 = \widehat{F}_1$ (vert. opp. \angle's) $\therefore \widehat{E}_1 = \widehat{F}_1$</p> <p>OR/OF EDFB is a parallelogram (proven in 8.1.1) $\widehat{E}_2 = \widehat{F}_2$ (opp \angles m =) $\widehat{E}_1 = \widehat{F}_1$ (\angles on straight line)</p>	<p>✓ S ✓ R ✓ S ✓ R (4)</p> <p>✓ S ✓ R ✓ S ✓ S/R (4)</p> <p>✓ S ✓ R ✓ S ✓ S/R (4)</p> <p>✓ S ✓ R ✓ S ✓ R (4)</p>

<p>8.2</p>		
<p>8.2.1</p>	<p> $AP = BP$ (given) $OA = OB$ (radii) $OAPB$ is a kite (two pairs adj sides =) $AT = TB$ (one diag of kite bisects the other) OR/OF In $\triangle OAP$ and $\triangle OBP$ 1. $AP = BP$ (given) 2. $OA = OB$ (radii) 3. OP is common $\therefore \triangle OAP \cong \triangle OBP$ (SSS) $\hat{O}_1 = \hat{O}_2$ ($\cong \Delta s$) In $\triangle OAT$ and $\triangle OBT$ 1. $\hat{O}_1 = \hat{O}_2$ ($\cong \Delta s$) 2. $OA = OB$ (radii) 3. OT is common $\therefore \triangle OAT \cong \triangle OBT$ (S\angleS) $AT = TB$ ($\cong \Delta s$) </p>	<p> ✓ S ✓ $OA = OB$ ✓ $OAPB$ is a kite/'n vlieër ✓ two pairs adj sides = ✓ reason/rede (5) ✓ $AP = BP$ ✓ $OA = OB$ ✓ $\hat{O}_1 = \hat{O}_2$ or $\hat{P}_1 = \hat{P}_2$ ($\cong \Delta s$) ✓ $\therefore \triangle OAT \cong \triangle OBT$ or $\triangle PAT \cong \triangle PBT$ ✓ $\cong \Delta s$ (5) </p>
<p>8.2.2</p>	<p> $\hat{O}TA = 90^\circ$ (properties of a kite) OR/OF $\hat{O}TA = \hat{O}TB$ ($\triangle OTA \cong \triangle OTB$) but: $\hat{O}TA + \hat{O}TB = 180^\circ$ ($\angle s$ on a str.line) $\therefore \hat{O}TA = 90^\circ$ </p>	<p> ✓ R (1) ✓ R (1) </p>
<p>[15]</p>		

TOTAL/TOTAAL: 100