



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE/  
NASIONALE  
SENIOR SERTIFIKAAT**

**GRADE/GRAAD 12**

**SEPTEMBER 2014**

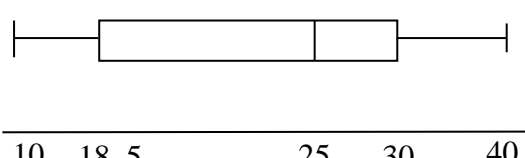
**MATHEMATICS P2/WISKUNDE V2  
MEMORANDUM**

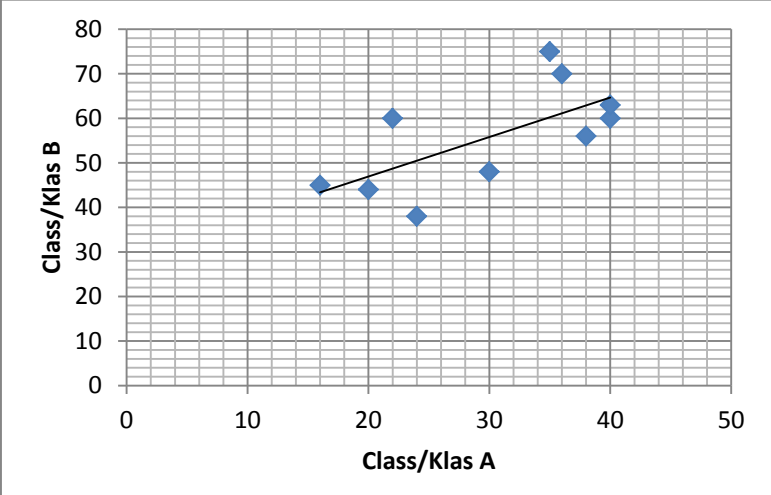
**MARKS/PUNTE: 150**

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This memorandum consists of 12 pages./  
*Hierdie memorandum bestaan uit 12 bladsye*

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QUESTION/VRAAG 1			
1.1	16	✓ answer/antwoord	(1)
1.2	$\text{Semi-IQR} = \frac{30-18,5}{2}$ $= 5,75$	✓ correct values <i>korrekte waardes</i> ✓ substitution into correct formula / <i>vervanging in</i> <i>korrekte formule</i> ✓ answer/antwoord	(3)
1.3	 <p>10   18,5                      25   30   40</p>	✓ Min and/en Max/Maks ✓ Q <sub>1</sub> & Q <sub>3</sub> ✓ Q <sub>2</sub>	(3)
1.4	The distribution is skewed to the left/ <i>Die verspreiding is skeef na links.</i>	✓ answer/antwoord	(1)
			<b>[8]</b>

QUESTION/VRAAG 2			
2.1		<p>✓✓ plotting points/ afsteek van punte</p> <p>✓ regression line/ regressielyn (2.3)</p>	(2)
2.2	<p><math>a = 29,22</math> (29,21542.....)  <math>b = 0,89</math>  <math>\therefore y = 29,22 + 0,89x</math></p>	<p>✓ calculating value of <math>a</math> and <math>b</math>  <i>bereken waardes van a en b</i></p> <p>✓ equation for the line/<i>vergelyking vir die lyn</i></p>	(2)
2.3	On graph/ <i>Op grafiek</i>		(1)
2.4	<p><math>r = 0,66</math></p> <p style="text-align: center;">OR/OF</p> $s_y = \sqrt{\frac{\sum(y - \bar{y})^2}{n}}$ $= \sqrt{\frac{1290,9}{10}} = 11,36$ $s_x = \sqrt{\frac{\sum(x - \bar{x})^2}{n}}$ $= \sqrt{\frac{720,9}{10}} = 8,49$ <p><math>b = r \frac{s_y}{s_x}</math> then/<i>dan</i> <math>0,89 = r \frac{11,36}{8,49}</math>; <math>r = 0,66</math></p>	<p>✓✓ answer/<i>antwoord</i></p> <p>✓ <math>S_y, S_x</math></p> <p>✓ answer/<i>antwoord</i></p>	(2)
2.5	<p>Mean/<i>Gemiddelde</i>, <math>\bar{x} = \frac{559}{10} = 55,90</math> (Answer only: Full marks)  <i>(Slegs antwoord: Volpunte)</i></p> <p>Standard deviation/<i>Standaardafwyking</i>, <math>\sigma = 11,36</math></p>	<p>✓✓ answer/<i>antwoord</i></p> <p>✓✓ answer/<i>antwoord</i></p>	(4)
2.6	<p><math>55,9 - 11,36</math> and <math>55,9 + 11,36</math>  <math>[44,54; 67,26]</math>          6 scores/<i>tellings</i></p>	<p>✓ interval/<i>interval</i></p> <p>✓ answer/<i>antwoord</i></p>	(2)
			<b>[13]</b>

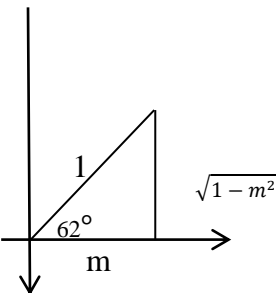
QUESTION/VRAAG 3			
3.1	$y = 9$	✓ answer/antwoord	(1)
3.2	<p><math>AB = 11</math> units/eenhede  <b>OR/OF</b></p> $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $AB = \sqrt{(11 - 0)^2 + (9 - 9)^2}$ <p><math>AB = 11</math> units/eenhede</p>	✓ answer/antwoord	(1)
3.3	D(13; 9)	✓ answer/antwoord	(1)
3.4	<p>Area of <math>\triangle ABC = \frac{1}{2} AB \cdot CD</math> (Oppervlakte van . . . )  <math>= \frac{1}{2}(11 \times 8)</math>  <math>= 44</math> square units/vierkante eenhede</p>	<p>✓ length of CD /  <i>lengte van CD</i>            ✓ Substitute into            correct formula /  <i>Vervanging in</i>  <i>korrekte formule</i>            ✓ answer/antwoord</p>	(3)
3.5	$M = \left[ \frac{x_2 + x_1}{2} ; \frac{y_2 + y_1}{2} \right]$ $= \left[ \frac{13}{2} ; \frac{10}{2} \right]$ $= [6,5 ; 5]$	<p>✓ substitution into            midpoint formula/  <i>vervanging in</i>  <i>middelpunt formule</i>            ✓ answer/antwoord</p>	(2)
3.6	$m_{AC} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{9 - 1}{0 - 13}$ $m_{AC} = -\frac{8}{13}$ $y - y_1 = m(x - x_1)$ $y - 5 = \frac{13}{8}(x - 6,5)$ $y = \frac{13}{8}x - 5\frac{9}{16}$	<p>✓ <math>m_{AC}</math>            ✓ correct gradient            of perpendicular            bisector/<i>korrekte</i>  <i>gradient van</i>  <i>middelloodlyn</i>            ✓ Substitution into            correct formula/  <i>Vervanging in</i>  <i>korrekte formule</i>            ✓ answer/antwoord</p>	(4)
3.7	$y = \frac{13}{8}(11) - \frac{89}{16}$ $y = \frac{143}{8} - \frac{89}{16}$ $y = \frac{197}{16}$ <p>No, it does not pass through B/<i>Nee, dit gaan nie deur B nie.</i></p>	<p>✓ substitution into            correct equation /  <i>vervanging in</i>  <i>korrekte vergelyking</i>            ✓ answer/antwoord            (justification/  <i>regverdiging</i>)</p>	(2)

3.8	$m_{BC} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{11 - 13}{9 - 1}$ $= \frac{8}{-2} = -4$ $\tan \theta = -4$ $\theta = 104,04^\circ$ $\widehat{ABC} = 104,04^\circ$	✓ $m_{BC}$ ✓ $\tan \theta$ ✓ answer/antwoord	(3)
3.9	$y - y_1 = m(x - x_1)$ $y - 9 = -\frac{8}{13}(x - 13)$ $y = -\frac{8}{13}x + 8 + 9$ $y = -\frac{8}{13}x + 17$	✓ substitution/vervanging ✓ answer/antwoord	(2)
			<b>[19]</b>

<b>QUESTION/VRAAG 4</b>			
4.1	$x^2 - 2x + y^2 + 4y = a$ $(x - 1)^2 + (y + 2)^2 = a + 1 + 4$ $(x - 1)^2 + (y + 2)^2 = a + 5$ $\therefore a + 5 = r^2$ $a + 5 = 25$ $a = 20$	✓✓ completing the square/voltooiing van vierkant ✓ equating $r^2$ /gelyk stel aan $r^2$ ✓ $r^2 = 25$	(4)
4.2	M (1; -2)	✓ answer in coordinate form/antwoord in koördinaat vorm	(1)
4.3	$x^2 - 2x + y^2 + 4y = 20 \quad A(x; y)$ $\therefore (4)^2 - 2(4) + y^2 + 4y = 20$ $16 - 8 + y^2 + 4y = 20$ $y^2 + 4y - 12 = 0$ $(y + 6)(y - 2) = 0$ $\therefore y = -6 \text{ or/of } y = 2$ $y = 2$ $A(4; 2) \quad y > 0$	✓ substituting into correct formula/vervanging in korrekte formule ✓ standard form/standaardvorm ✓ factors/faktore ✓ correct answer/korrekte antwoord	(4)
4.4	$m_{MA} = \frac{2 + 2}{4 - 1} = \frac{4}{3}$ $m_{\text{tangent}} = -\frac{3}{4}$ $y - y_1 = m(x - x_1)$ $\therefore y - 2 = -\frac{3}{4}(x - 4)$ $y = -\frac{3}{4}x + 3 + 2$ $\therefore y = -\frac{3}{4}x + 5$	✓ $m_{MA} = \frac{4}{3}$ ✓ $m_{\text{tan.}} = -\frac{3}{4}$ ✓ substituting into correct formula/vervanging in korrekte formule ✓ answer/antwoord	(4)

4.5	$M(1; -2), T(-1; -2)$ $MT = \sqrt{(-1 - 1)^2 + (-2 + 2)^2}$ $= 2$ $2 < \sqrt{20}$  <p style="text-align: center;"><b>OR/OF</b></p> $x^2 - 2x + y^2 + 4y = 20 \quad T(-1; -2)$ $LHS = (-1)^2 - 2(-1) + (-2)^2 + 4(-2)$ $LHS = 1 + 2 + 4 - 8$ $LHS = -1$ $LHS \neq RHS$ $-1 < 20$ $\therefore T$ lies inside the circle/ <i>T lê binne die sirkel</i>	<ul style="list-style-type: none"> <li>✓ substitution/<i>vervang</i></li> <li>✓ simplification/<i>vereenvoudig</i></li> <li>✓ answer/<i>antwoord</i></li> </ul>	(3)
4.6	$(x - 1)^2 + (y + 2)^2 = 20$ $(x - 1 + 3)^2 + (y + 2 - 1)^2 = 20$ $(x + 2)^2 + (y + 1)^2 = 20$	<ul style="list-style-type: none"> <li>✓ substitution into correct formula/<i>vervang in korrekte formule</i></li> <li>✓ simplification and answer (<math>x + 2</math>) and (<math>y + 1</math>) / <i>vereenvoudig en antwoord (<math>x + 2</math>) en (<math>y + 1</math>)</i></li> </ul>	(3)
			<b>[19]</b>

**QUESTION/VRAAG 5**

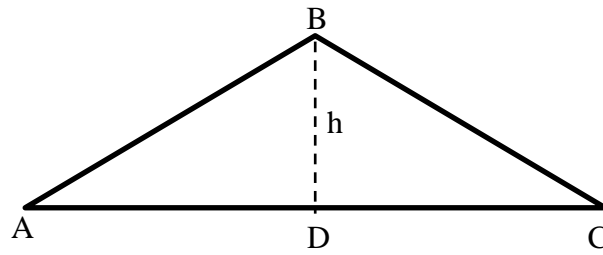
5.1.1	$\sin 28^\circ = \sin(90^\circ - 62^\circ)$ $= \cos 62^\circ$ $= m$  	<ul style="list-style-type: none"> <li>✓ equation/<i>vergelyking</i></li> <li>✓ answer/<i>antwoord</i></li> </ul>	(2)
5.1.2	$\cos 362^\circ = \cos(2^\circ)$ $= \cos(62^\circ - 60^\circ)$ $= \cos 62^\circ \cos 60^\circ + \sin 62^\circ \sin 60^\circ$ $= \frac{1}{2}m + \frac{\sqrt{3}}{2}(\sqrt{1 - m^2})$	<ul style="list-style-type: none"> <li>✓ <math>\cos 2^\circ</math></li> <li>✓ <math>62^\circ - 60^\circ</math></li> <li>✓ expansion/<i>uitbreiding</i></li> <li>✓ substitution/<i>vervang</i></li> </ul>	(4)
5.2.1	$\frac{\tan(360^\circ - x) \cdot \sin(90^\circ + x)}{\sin(-x)}$ $= \frac{-\tan x \cdot \cos x}{-\sin x}$ $= \frac{\frac{\sin x}{\cos x} \times \cos x}{\sin x}$ $= 1$	<ul style="list-style-type: none"> <li>✓ <math>-\tan x</math></li> <li>✓ <math>\cos x</math></li> <li>✓ <math>-\sin x</math></li> <li>✓ <math>\frac{\sin x}{\cos x}</math></li> <li>✓ answer/<i>antwoord</i></li> </ul>	(5)

5.3	$4 \sin^2 \theta = 3$ $\sin^2 \theta = \frac{3}{4}$ $\therefore \sin \theta = \pm \frac{\sqrt{3}}{2}$ $\therefore \theta = 120^\circ; 90^\circ < \theta < 180^\circ$ $= \cos \frac{1}{4} \theta \cdot \sin \frac{1}{2} \theta - \tan(3\theta - 45^\circ)$ $= \cos 30^\circ \cdot \sin 60^\circ - \tan(360^\circ - 45^\circ)$ $= \cos 30^\circ \cdot \sin 60^\circ + \tan 45^\circ$ $= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + 1$ $= 1\frac{3}{4}$	<ul style="list-style-type: none"> <li>✓ simplification/vereenvoudiging</li>   <li>✓ value of/waarde van <math>\theta</math></li>   <li>✓ substitution of/vervanging van <math>\theta</math></li> <li>✓ <math>\cos 30^\circ = \frac{\sqrt{3}}{2}</math></li> <li>✓ <math>\sin 60^\circ = \frac{\sqrt{3}}{2}</math></li> <li>✓ <math>\tan 45^\circ = 1</math></li> </ul>	(6) <b>[17]</b>
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QUESTION/VRAAG 6			
	$\text{LHS} = \frac{\cos 2x}{1 + \sin 2x}$ $= \frac{\cos^2 x - \sin^2 x}{1 + 2 \sin x \cos x}$ $= \frac{\sin^2 x + 2 \sin x \cos x + \cos^2 x}{(\cos x + \sin x)(\cos x - \sin x)}$ $= \frac{(\sin x + \cos x)(\sin x + \cos x)}{(\cos x - \sin x)(\sin x + \cos x)}$ $= \frac{\cos x - \sin x}{\sin x + \cos x}$	<ul style="list-style-type: none"> <li>✓ expansion in numerator/ <i>uitbreiding van teller</i></li> <li>✓ expansion in denominator/ <i>uitbreiding van noemer</i></li>   <li>✓ <math>\sin^2 x + \cos^2 x</math></li>   <li>✓ factorisation/faktorisering</li> </ul>	<b>[4]</b>

## QUESTION/VRAAG 7

7.1



Let/Laat  $BD = h$  (height of triangle/hoogte van driehoek ABC)

Let/Laat  $DC = x$

$$\therefore AD = (b - x)$$

Proof/Bewys:

$$\begin{aligned} c^2 &= h^2 + (b - x)^2 \\ &= h^2 + b^2 - 2bx + x^2 \\ &= b^2 + (h^2 + x^2) - 2bx \\ &= b^2 + a^2 - 2bx \\ a^2 &= h^2 + x^2 \end{aligned}$$

$$\frac{x}{a} = \cos C$$

$$x = a \cos C$$

$$\therefore b^2 + a^2 - 2ab \cos C$$

✓ AD in terms of  $x$   
AD in terme van  $x$

✓  $c^2$  (using/gebruik van Pythagoras)

✓  $(h^2 + x^2) = a^2$

✓ substitution of  $x$ /  
vervangings van  $x$

(4)

7.2.1

$$\angle PSQ = 90^\circ$$

$$\angle Q_2 = 90^\circ + \alpha$$

In  $\triangle QSR$ :

$$\begin{aligned} SR^2 &= SQ^2 + QR^2 - 2SQ \cdot QR \cdot \cos \angle SQR \\ &= x^2 + x^2 - 2x \cdot x \cdot \cos(90^\circ + \alpha) \\ &= 2x^2 - 2x^2(-\sin \alpha) \\ &= 2x^2 + 2x^2(\sin \alpha) \\ &= x^2(2 + 2\sin \alpha) \end{aligned}$$

$$\therefore SR = x\sqrt{2(1 + \sin \alpha)}$$

✓ angle in semi-circle/hoek in semi-sirkel

✓ use of cos rule/  
gebruik van cos-reël  
✓ correct substitution/  
korrekte vervanging

✓  $x^2(2 + 2\sin \alpha)$

(4)

7.2.2

$$5\sqrt{3} = x\sqrt{2(1 + \sin \alpha)}$$

$$5\sqrt{3} = 5\sqrt{2(1 + \sin \alpha)}$$

$$\sqrt{3} = \sqrt{2(1 + \sin \alpha)}$$

$$3 = 2(1 + \sin \alpha)$$

$$\frac{3}{2} = 1 + \sin \alpha$$

$$\frac{1}{2} = \sin \alpha$$

$$\frac{1}{2} = \sin \alpha$$

$$\alpha = 30^\circ$$

In  $\triangle PSQ$

$$\frac{QS}{PQ} = \sin \alpha$$

$$PQ = \frac{QS}{\sin \alpha}$$

$$= \frac{5}{\sin 30^\circ}$$

$$= 10 \text{ units/eenhede}$$

✓ Substitution/  
Vervanging

✓  $\sin \alpha = 0,5$   
✓  $\alpha = 30^\circ$

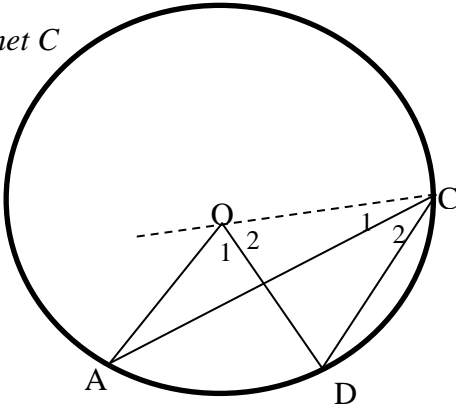
✓ answer/antwoord

(4)

**[12]**



QUESTION/VRAAG 8			
8.1	2	✓ answer / antwoord	(1)
8.2		<i>f</i> : ✓ <i>x</i> -int/ <i>x</i> -afsnit ✓ shape/ <i>vorm</i>  <i>g</i> : ✓ <i>x</i> -ints/ <i>x</i> -afsnitte ✓ <i>y</i> -int/ <i>y</i> -afsnit ✓ shape/ <i>vorm</i>	(5)
8.3	$-120^\circ \leq x \leq 60^\circ$	✓ critical values / <i>kritiese waardes</i> ✓ notation/ <i>notasie</i>	(2)
8.4	Translate <i>f</i> $30^\circ$ to the right / <i>Skuif f</i> $30^\circ$ na regs  <b>OR/OF</b>  Translate <i>f</i> down by $\frac{1}{2}$ / <i>Skuif f</i> 'n $\frac{1}{2}$ eenheid af	✓ correct translation/ <i>korrekte translasie</i>  ✓ correct translation/ <i>korrekte translasie</i>	(2)
			<b>[10]</b>

QUESTION/VRAAG 9				
9.1	<p>Const: Join O to C Konstr: Verbind O met C</p>  <p>Construction/Konstruksie: Join CO produced/Verbind CO verleng. Proof/Bewys: Let/Laat <math>C_1 = x</math> and/en <math>C_2 = y</math> <math>\angle A = x</math> [ <math>AO = OC = r</math> ] <math>\angle D = x + y</math> [ <math>OD = OC = r</math> ] <math>\angle AOC = 180^\circ - 2x</math> [Sum of angles of/Som v/d hoeke van <math>\Delta</math> ] <math>\angle DOC = 180^\circ - (2x + 2y)</math> [Sum of angles of <math>\Delta / \text{“}</math> ] But/Maar <math>\angle AOD = \angle AOC - \angle DOC</math> <math>\angle AOD = 2y</math> <math>\angle AOD = 2 \angle ACD</math></p>	<p>✓ Construction/ konstruksie</p> <p>✓ A and D (in terms of <math>x</math> and <math>y</math>) with reasons <i>A en D in terme van <math>x</math> en <math>y</math> met redes</i></p> <p>✓ AOC (in terms of <math>x</math>) with a reason <i>AOC in terme van <math>x</math> met rede</i></p> <p>✓ equation for AOD/ <i>gelykstel vir AOD</i></p> <p>✓ <math>\angle AOD = 2y</math></p>	(5)	
9.2	9.2.1	<p><math>MBC = MCB</math> [MB = MC; radii] <math>\angle B_3 = C_2 = x</math> [BO bisects/halveer MBC and/en OC bisects/halveer MCB] <math>\angle O_2 = 180^\circ - 2x</math> [angles of/hoeke van <math>\Delta</math> ]</p>	<p>✓ reason/rede ✓ <math>\angle B_3</math> and/en <math>C_2 = x</math> and reason/en rede ✓ answer/antwoord</p>	(4)
	9.2.2	<p><math>\angle A = \frac{1}{2}BMC</math> [angle at centre = <math>2 \times</math> angle at circ /middelpuntshoek = <math>2 \times</math> omtrekshoek] <math>= \frac{1}{2}(180^\circ - 4x)</math> [angles of/hoeke van <math>\Delta</math> ] <math>\angle A = 90^\circ - 2x</math></p> <p>Therefore/Daarom: <math>\angle ABO = O_2 - A</math> [ext. angle of/buitehoek van <math>\Delta OAB</math> ] <math>= (180^\circ - 2x) - (90^\circ - 2x)</math> <math>= 90^\circ</math></p> <p>AO subtends a right angle/AO onderspan 'n reghoek <math>\therefore</math> AO is a diameter/AO is 'n middellyn</p>	<p>✓ <math>\angle A = \frac{1}{2}BMC</math> (statement) and reason. (stelling) en rede ✓ substitution and answer/vervanging en antwoord ✓ <math>\angle ABO = O_2 - A</math> (statement) and reason (stelling) en rede ✓ substitution/vervanging <math>ABO = 90^\circ</math> ✓ answer/antwoord</p>	(5)

9.3	<p>In <math>\triangle EHO</math>, <math>OE = x</math> and <math>OH = x - 2</math>  <math>EH^2 = x^2 - (x - 2)^2</math> [Theorem of Pythagoras]  <math>EH^2 = x^2 - x^2 + 4x - 4</math>  <math>= 4(x - 1)</math>  <math>\therefore EH = 2\sqrt{x - 1}</math>  <math>\therefore EF = 4\sqrt{x - 1}</math> line from centre of circle .../lyn van middelpunt van sirkel ...]</p>	<p>✓ <math>OH = x - 2</math>                  ✓ Theorem of/Stelling van Pythagoras                  ✓ EH                  ✓ EF [with reason/met rede]</p>	(4)
			[19]

QUESTION/VRAAG 10			
10.1	<p><math>\angle ATB = 90^\circ</math> (subtended by diameter/onderspan deur middellyn)  <math>\therefore \angle ATB = \angle EPB = 90^\circ</math>  <math>\therefore</math> TEPB is a cyclic quad/is 'n koordevierhoek (ext/buite <math>\angle =</math> int opp/teenoorst. binne <math>\angle</math>)</p>	<p>✓ <math>\angle ATB = 90^\circ</math>                  ✓ <math>\angle ATB = \angle EPB = 90^\circ</math>                  ✓ conclusion with reason/gevolgtrekking met rede</p>	(3)
10.2	<p>In <math>\triangle ATB</math> and/en <math>\triangle APE</math>  <math>\angle A = \angle A</math> [common/gemeen]  <math>\angle ATB = \angle APE = 90^\circ</math>  <math>\therefore \triangle ATB \parallel \triangle APE</math> (<math>\angle, \angle, \angle</math>)</p>	<p>✓ statement with reason / stelling met rede                  ✓ <math>\angle ATB = \angle APE = 90^\circ</math>                  ✓ <math>\triangle ATB \parallel \triangle APE</math> with reason /met rede</p>	(3)
10.3	<p><math>\angle RTA = \angle TBA</math> (tangent chord/raaklyn-koord)  <math>\angle RTA = \angle ETP</math> (vertically opposite/regoorst)  <math>\angle TBA = \angle TEP</math> (ext/buite <math>\angle</math> of cyclic quad/van koordevierhoek)  <math>\triangle TPE</math> is Isosceles/gelykbenig. (<math>\angle ETP = \angle TEP</math>)  <math>\therefore TP = PE</math></p>	<p>✓ <math>\angle RTA = \angle TBA</math> (statement) with reason. (stelling) met rede                  ✓ <math>\angle RTA = \angle ETP</math> (statement) with reason (stelling) met rede                  ✓ statement with reason (stelling) met rede                  ✓ <math>\triangle TPE</math> is Isosceles/gelykbenig                  ✓ reason/rede                  ✓ conclusion/slotsom</p>	(6)
10.4	<p><math>\angle ATB = \angle EPB = 90^\circ</math>  <math>\angle PTB = \angle A</math> [tan chord/raaklyn-koord]  <math>\angle PTB = \angle PEB</math> [subtended by BP/onderspan deur BP]  <math>\therefore \angle A = \angle PEB</math>                  Hence/Vervolgens <math>\triangle ATB \parallel \triangle EPB</math> [equiangular/gelykhoekig]</p>	<p>✓ <math>\angle ATB = \angle EPB = 90^\circ</math>                  ✓ <math>\angle PTB = \angle A</math> (statement) with reason (stelling) met rede                  ✓ <math>\angle PTB = \angle PEB</math> (statement) with reason (stelling) met rede                  ✓ <math>\angle A = \angle PEB</math>                  ✓ conclusion/slotsom</p>	(5)
10.5	<p><math>\frac{BP}{TB} = \frac{BE}{AB}</math> (<math>\triangle ATB \parallel \triangle EPB</math>)  <math>AB \cdot BP = BE \cdot TB</math>  <math>2BP \cdot BP = BE \cdot TB</math> [<math>AO = OB = BP</math>]  <math>2BP^2 = BE \cdot TB</math></p>	<p>✓ statement with reason stelling met rede                  ✓ <math>AB \cdot BP = BE \cdot TB</math>                  ✓ <math>2BP \cdot BP = BE \cdot TB</math> (statement) with reason (stelling) met rede                  ✓ answer/antwoord</p>	(4)
			[21]

QUESTION/VRAAG 11			
11.1	Divides the two other sides proportionally/ <i>verdeel die twee ander sye eweredig.</i>		✓ answer/ <i>antwoord</i> (1)
11.2	11.2.1	$\frac{KD}{DL} = \frac{2x}{x}$ $\frac{KE}{EM} = \frac{2y}{y} \quad [ED // LM]$ $LM^2 = KL^2 + KM^2 \quad [\text{Pythagoras}]$ $= (3x)^2 + (3y)^2$ $= 9x^2 + 9y^2$ $= 9 DL^2 + 9 EM^2 \quad \dots\dots\dots 1$	✓✓ proportions / <i>eweredighede</i>  ✓ Pythagoras  ✓ answer/ <i>antwoord</i> (4)
	11.2.2	$DM^2 + LE^2 = KM^2 + KD^2 + EK^2 + KL^2$ $= (3y)^2 + (2x)^2 + (2y)^2 + (3x)^2$ $= 9y^2 + 4x^2 + 4y^2 + 9x^2$ $= 13y^2 + 13x^2$ $= 13 EM^2 + 13 DL^2$ $= 13(EM^2 + DL^2)$ $= 13 \times \frac{LM^2}{9}$ $= \frac{13}{9} LM^2$	✓ statement/ <i>stelling</i>  ✓ substitution and simplification/ <i>vervanging en vereenvoudiging</i>  ✓ use of 1/ <i>gebruik van 1</i>  ✓ conclusion/ <i>slotsom</i> (4)
			[9]

**TOTAL/TOTAAL: 150**