

SA's Leading Past Year

Exam Paper Portal



You have Downloaded, yet Another Great  
Resource to assist you with your Studies 😊

Thank You for Supporting SA Exam Papers

Your Leading Past Year Exam Paper Resource Portal

Visit us @ [www.saexampapers.co.za](http://www.saexampapers.co.za)



**SA EXAM  
PAPERS**



education

Department of  
Education  
FREE STATE PROVINCE

**PREPARATORY EXAMINATION/  
VOORBEREIDENDE EKSAMEN**

**GRADE/GRAAD 12**

**MATHEMATICS P2/  
WISKUNDE V2**

**SEPTEMBER 2020**

**MARKS/PUNTE: 150**

**MARKING GUIDELINES/  
NASIENRIGLYNE**

**This marking guidelines consists of 13 pages./  
*Hierdie nasienriglyne bestaan uit 13 bladsye.***

**NOTE:**

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt of a question and not redone the question, mark the crossed out version.
- Consistent accuracy applies in ALL aspects of the marking memorandum. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

**NOTA:**

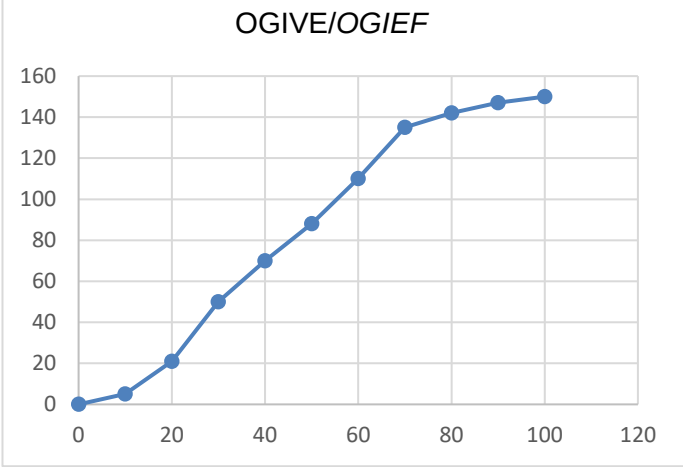
- As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n antwoord van 'n vraag doodtrek en nie oordoen nie, sien die doodgetrekte poging na.
- Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyne toegepas. Hou op nasien by die tweede berekeningsfout.
- Om antwoorde/waardes te aanvaar om 'n probleem op te los, word NIE toegelaat NIE.

| <b>GEOMETRY/MEETKUNDE</b> |                                                                                                               |
|---------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>S</b>                  | <b>A mark for a correct statement<br/>(A statement mark is independent of a reason)</b>                       |
|                           | <i>'n Punt vir 'n korrekte bewering<br/>( 'n Punt vir 'n bewering is onafhanklik van die rede)</i>            |
| <b>R</b>                  | <b>A mark for the correct reason<br/>(A reason mark may only be awarded if the statement is correct)</b>      |
|                           | <i>'n Punt vir 'n korrekte rede<br/>( 'n Punt word slegs vir die rede toegeken as die bewering korrek is)</i> |
| <b>S/R</b>                | <b>Award a mark if statement AND reason are both correct</b>                                                  |
|                           | <i>Ken 'n punt toe as die bewering EN die rede beide korrek is</i>                                            |

**QUESTION/VRAAG 1**

|     |                                                                                                                                                                           |                                                                                                                                   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 1.1 | <p style="text-align: center;"><b>Scatter Plot/Spreidiagram</b></p> <p style="text-align: center;"><b>Exchange rate/Wisselkoers in R/\$</b></p>                           | <p>✓ 4 points correctly plotted</p> <p>✓ 9 points correctly plotted</p> <p>✓ All points</p> <p style="text-align: right;">(3)</p> |
| 1.2 | $y = 158,67 - 11,96x$                                                                                                                                                     | <p>✓✓✓ Correct equation</p> <p style="text-align: right;">(3)</p>                                                                 |
| 1.3 | $r = -0,91$                                                                                                                                                               | <p>✓ value of r</p> <p style="text-align: right;">(1)</p>                                                                         |
| 1.4 | <p>Exchange rate increase, oil price decrease/Wisselkoers verhoog, olieprys verlaag</p> <p><b>OR/OF</b></p> <p>Strong Negative correlation/Sterk negatiewe korrelasie</p> | <p>✓ ✓ reason</p> <p style="text-align: right;">(2)</p>                                                                           |
| 1.5 | $y = 71,05$                                                                                                                                                               | <p>✓ <math>y = 71,05</math></p> <p style="text-align: right;">(1)</p>                                                             |
| 1.6 | Standard deviation/Standaard afwyking : $\sigma = 4,09$                                                                                                                   | <p>✓ <math>\sigma = 4,09</math></p> <p style="text-align: right;">(1)</p>                                                         |
| 1.7 | <p><math>71,05 + 2(4,09) = 79,23</math> (With calculator 79,22)</p> <p>December</p>                                                                                       | <p>✓ 79,23</p> <p>✓ December/ Desember</p> <p style="text-align: right;">(2)</p>                                                  |
|     |                                                                                                                                                                           | <b>[13]</b>                                                                                                                       |

**QUESTION/VRAAG 2**

|       |                                                                                                                                          |                                                                                                     |
|-------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 2.1   |  <p style="text-align: center;"><b>OGIVE/OGIEF</b></p> | <p>✓grouded</p> <p>✓Cf</p> <p>✓upper limit</p> <p>✓ curve</p> <p style="text-align: right;">(4)</p> |
| 2.2.1 | <p>(8;144)</p> <p>144 below 85 % (accept/aanvaar 144-146)</p>                                                                            | <p>✓(8;144)</p> <p>✓ 144 (2)</p>                                                                    |
| 2.2.2 | <p><math>Q_2 = 42,77</math> (accept/aanvaar 41-43)</p>                                                                                   | <p>✓<math>Q_2 = 42,77</math></p> <p style="text-align: right;">(1)</p>                              |
|       |                                                                                                                                          | <b>[7]</b>                                                                                          |

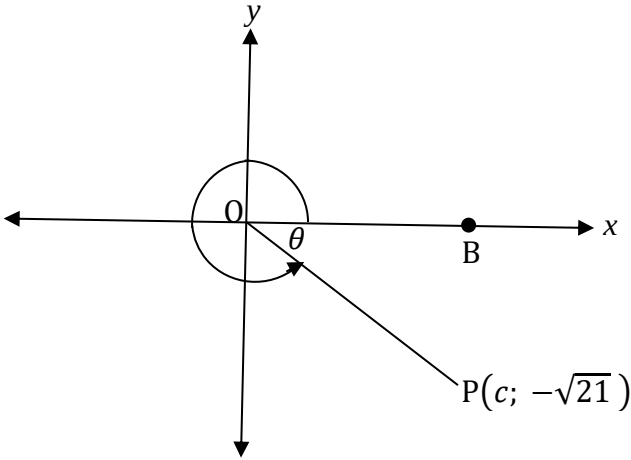
**QUESTION/VRAAG 3**

|     |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                 |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 | $M_{AD} = \frac{7-(-3)}{1-(-4)}$ $= 2$                                                                                                                                                                                                                                      | <p>✓ Substitution into the correct formula</p> <p>✓ Answer (2)</p>                                                                                                              |
| 3.2 | <p>AD// BC</p> $M_{AD} = M_{BC} = 2$ $-8 = 2(2) + c$ $\therefore y = 2x - 4$                                                                                                                                                                                                | <p>✓ <math>M_{BC} = 2</math></p> <p>✓ sub</p> <p>✓ Answer (3)</p>                                                                                                               |
| 3.3 | <p>At F <math>y = 0</math></p> $0 = 2x - 4$ $\therefore x = 2$ $\therefore F(2; 0)$                                                                                                                                                                                         | <p>✓ <math>0 = 2x - 4</math></p> <p>✓ <math>x = 2</math> (2)</p>                                                                                                                |
| 3.4 | <p><math>B(x; y) - 7 \quad C(x + 2; y - 5)</math></p> <p><math>A(1; 7) \rightarrow B'(3; 2)</math></p> <p style="text-align: center;">OR</p> $x_B = -2 + (1 + 4) = 3$ $y_B = -8 + (7 + 3) = 2$                                                                              | <p>✓ ✓ <math>B'(3; 2)</math> (2)</p>                                                                                                                                            |
| 3.5 | $M_{BC} = \tan \theta = 2$ $\theta = 63,43^\circ$<br>$M_{DC} = \frac{-8 - (-3)}{-2 - (-4)} = \frac{-5}{2}$ $\tan \beta = \frac{-5}{2}$ $\beta = 180^\circ - 68,20^\circ = 111,80^\circ$ $\alpha = 111,80^\circ - 63,43^\circ = 48,37^\circ$                                 | <p>✓ <math>\theta = 63,43^\circ</math></p> <p>✓ <math>\frac{-5}{2}</math></p> <p>✓ <math>\beta = 111,80^\circ</math></p> <p>✓ <math>\alpha = 48,37</math> (4)</p>               |
| 3.6 | $DC = \sqrt{(-4 + 2)^2 + (-3 + 8)^2}$ $= \sqrt{29}$ $CF = \sqrt{(-2 - 2)^2 + (-8 - 0)^2}$ $= \sqrt{80}$<br>$\text{Area/Oppvl } \triangle DCF = \frac{1}{2} DC \cdot CF \sin \alpha$ $= \frac{1}{2} \sqrt{29} \cdot \sqrt{80} \sin 48,37^\circ$ $= 18 \text{ units/eenhede}$ | <p>✓ sub correct formula</p> <p>✓ <math>\sqrt{29}</math></p> <p>✓ sub correct formula</p> <p>✓ <math>\sqrt{80}</math></p><br><p>✓ sub correct formula</p> <p>✓ 18 units (6)</p> |
|     |                                                                                                                                                                                                                                                                             | <b>[19]</b>                                                                                                                                                                     |

**QUESTION/VRAAG 4**

|     |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 | $x^2 + y^2 + 2x + 6y + 2 = 0$<br>$x^2 + 2x + 1 + y^2 + 6y + 9 = -2 + 10$<br>$(x + 1)^2 + (y + 3)^2 = 8$<br>$M(-1; -3)$                                                                                                                                                                               | $\checkmark 8$<br>$\checkmark \checkmark M(-1; -3)$<br><b>(3)</b>                                                                                |
| 4.2 | $r = \sqrt{8}$                                                                                                                                                                                                                                                                                       | $\checkmark r = \sqrt{8}$<br><b>(1)</b>                                                                                                          |
| 4.3 | $x^2 + (x - 2)^2 + 2x + 6(x - 2) + 2 = 0$<br>$2x^2 + 4x - 6 = 0$<br>$x^2 + 2x + 3 = 0$<br>$(x + 3)(x - 1) = 0$<br>$x = -3$ or $x \neq 1$<br>$y = -3 - 2 = -5$<br>$\therefore D(-3; -5)$                                                                                                              | $\checkmark$ substitution<br>$\checkmark x^2 + 2x + 3 = 0$<br>$\checkmark (x + 3)(x - 1) = 0$<br>$\checkmark \checkmark D(-3; -5)$<br><b>(5)</b> |
| 4.4 | Angle between radius/diameter and tangent/ <i>Hoek tussen radius/deursnee en raaklyn</i>                                                                                                                                                                                                             | $\checkmark R$<br><b>(1)</b>                                                                                                                     |
| 4.5 | $MB^2 = MD^2 + DB^2$ Pyth<br>$= (\sqrt{8})^2 + 4(\sqrt{2})^2$<br>$= 40$<br><br>$MB = \sqrt{40}$ radius of Circle/radius van sirkel $C_2$                                                                                                                                                             | $\checkmark S$<br>$\checkmark (\sqrt{8})^2 + 4(\sqrt{2})^2$<br>$\checkmark 40$<br><br>$\checkmark MB = \sqrt{40}$<br><b>(4)</b>                  |
| 4.6 | $(x + 1)^2 + (y + 3)^2 = 40$                                                                                                                                                                                                                                                                         | $\checkmark$ Equation of $C_2$<br><b>(1)</b>                                                                                                     |
| 4.7 | Distance from/Afstand van $(2\sqrt{5}; 0)$ to centre/tot middelpunt<br>$= \sqrt{(2\sqrt{5} + 1)^2 + (0 + 3)^2}$<br>$= 6,24$<br>$6,24 < 6,32 (\sqrt{40})$<br>Distance to centre < radius of circle/Afstand tot middelpunt < radius van die sirkel<br>$\therefore (2\sqrt{5}; 0)$ lies inside/lê binne | $\checkmark$ correct sub<br>$\checkmark 6,24$<br>$\checkmark 6,24 < 6,32 (\sqrt{40})$<br>$\checkmark$ lies inside<br><b>(4)</b>                  |
| 4.8 | $M_{MDP} = \frac{-3 - (-5)}{-1 - (-3)} = \frac{2}{2} = 1$<br>$\therefore M$ tangent = $-1$                                                                                                                                                                                                           | $\checkmark M_{MDP} = 1$<br><br>$\checkmark M$ tangent = $-1$<br><b>(2)</b>                                                                      |
|     |                                                                                                                                                                                                                                                                                                      | <b>[21]</b>                                                                                                                                      |

**QUESTION/VRAAG 5**

|             |                                                                                                                                                                                                                   |                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.1.1       |  $c^2 + (\sqrt{21})^2 = 5^2$ $c^2 = 25 - 21$ $c^2 = 4$ $\therefore c = 2$                                                       | <p>✓ Subst. into pyth</p> <p>✓ Answer (2)</p>                                                                                                                           |
| 5.1.2<br>a) | $\cos \theta = \frac{2}{5}$                                                                                                                                                                                       | <p>✓ Answer (1)</p>                                                                                                                                                     |
| b)          | $\frac{-\sqrt{21}}{2} + \left(\frac{-\sqrt{21}}{5}\right)^2$ $-5\sqrt{21} + 42/50$                                                                                                                                | <p>✓ <math>\frac{-\sqrt{21}}{2} + \left(\frac{-\sqrt{21}}{5}\right)^2</math></p> <p>✓ Answer (2)</p>                                                                    |
| c)          | $2\sin \theta \cos \theta$ $= 2 \left(\frac{-\sqrt{21}}{5}\right) \left(\frac{2}{5}\right)$ $= \frac{-4\sqrt{21}}{25}$                                                                                            | <p>✓ <math>2 \left(\frac{-\sqrt{21}}{5}\right) \left(\frac{2}{5}\right)</math></p> <p>✓ Answer (2)</p>                                                                  |
| 5.2         | $\frac{(-\sin x) \cdot \tan x \cdot \cos(360^\circ - 30^\circ)}{(-\sin x)^2}$ $= \frac{-\sin x \cdot \tan x (\cos 30^\circ)}{\sin^2 x}$ $= \frac{-\sqrt{3}}{2} \tan x \div \sin x$ $= \frac{-\sqrt{3}}{2 \cos x}$ | <p>✓ <math>-\sin x</math></p> <p>✓ <math>(-\sin x)^2</math></p> <p>✓ <math>\frac{-\sqrt{3}}{2}</math></p> <p>✓ ✓ <math>\frac{-\sqrt{3}}{2 \cos x}</math></p> <p>(5)</p> |
|             |                                                                                                                                                                                                                   | [12]                                                                                                                                                                    |

**QUESTION/VRAAG 6**

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.1 | $LHS = \frac{2 \sin^2 x}{2 \frac{\sin x}{\cos x} - 2 \sin x \cos x}$ $= \frac{2 \sin^2 x}{2 \sin x \left( \frac{1}{\cos x} - \cos x \right)}$ $= \frac{\sin x}{1 - \cos^2 x} \quad \therefore LHS = RHS$ $\frac{\sin x}{\cos x}$ $= \sin x \times \frac{\cos x}{\sin^2 x}$ $= \frac{\cos x}{\sin x}$                                                                                                                                                                                                                                                                                                                                        | <p>✓ <math>\frac{\sin x}{\cos x}</math></p> <p>✓ <math>2 \sin x \cos x</math></p> <p>✓ <math>2 \sin x \left( \frac{1}{\cos x} - \cos x \right)</math></p> <p>✓ <math>\frac{\sin x}{1 - \cos^2 x}</math></p> <p>✓ <math>\sin^2 x</math></p> <p>(5)</p> |
| 6.2 | $\sin^2 20^\circ + \sin^2 40^\circ + \sin^2 80^\circ$ $= \sin^2 20^\circ + [\sin(60^\circ - 20^\circ)]^2 + [\sin(60^\circ + 20^\circ)]^2$ $= \sin^2 20^\circ + [\sin 60^\circ \cos 20^\circ - \cos 60^\circ \sin 20^\circ]^2$ $+ [\sin 60^\circ \cos 20^\circ + \cos 60^\circ \sin 20^\circ]^2$ $= \sin^2 20^\circ + \left[ \frac{\sqrt{3}}{2} \cos 20^\circ - \frac{1}{2} \sin 20^\circ \right]^2$ $+ \left[ \frac{\sqrt{3}}{2} \cos 20^\circ + \frac{1}{2} \sin 20^\circ \right]^2$ $= \frac{3}{2} \sin^2 20^\circ + \frac{3}{2} \cos^2 20^\circ$ $= \frac{3}{2} (\sin^2 20^\circ + \cos^2 20^\circ)$ $= \frac{3}{2} (1)$ $= \frac{3}{2}$ | <p>✓✓ compound</p> <p>✓ sub of special angle</p> <p>✓ simplification</p> <p>✓ common factor</p> <p>✓ square identity</p> <p>✓ answer</p> <p>(7)</p>                                                                                                   |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>[12]</b>                                                                                                                                                                                                                                           |

**QUESTION/VRAAG 7**

|     |                                                                                                                                                                                                                                                                                                                   |                                                                |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 7.1 | <p>In <math>\triangle ABC</math></p> $\sin \theta = \frac{h}{AC}$ $\therefore AC = \frac{h}{\sin \theta}$                                                                                                                                                                                                         | <p>✓ trig ratio</p> <p>✓ answer (2)</p>                        |
| 7.2 | <p>In <math>\triangle ABD</math></p> $\sin \alpha = \frac{h}{AD}$ $\therefore AD = \frac{h}{\sin \alpha}$                                                                                                                                                                                                         | <p>✓ trig ratio</p> <p>✓ answer (2)</p>                        |
| 7.3 | $CD^2 = AC^2 + AD^2 - 2AC \cdot AD \cos \beta$ $= \left(\frac{h}{\sin \theta}\right)^2 + \left(\frac{h}{\sin \alpha}\right)^2 - 2 \cdot \frac{h}{\sin \theta} \cdot \frac{h}{\sin \alpha} \cos \beta$ $= \frac{h^2}{\sin^2 \theta} + \frac{h^2}{\sin^2 \alpha} - \frac{2h^2 \cos \beta}{\sin \theta \sin \alpha}$ | <p>✓ cosine rule</p> <p>✓ substitution</p> <p>✓ answer (3)</p> |
|     |                                                                                                                                                                                                                                                                                                                   | <b>[7]</b>                                                     |

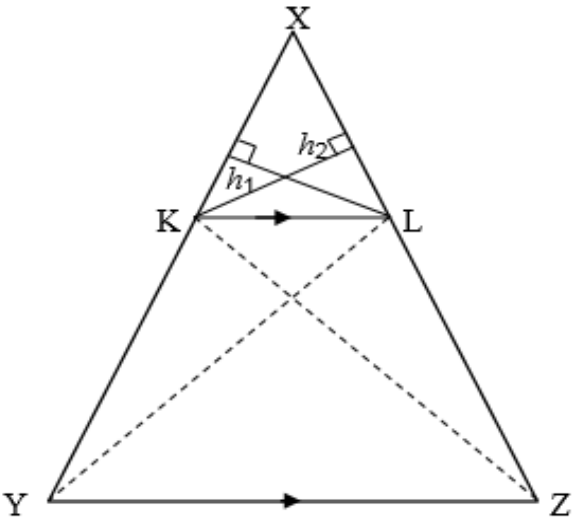
**QUESTION/VRAAG 8**

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                  |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.1 | <p> <math>\cos \frac{x}{2} = \sin(x - 30^\circ)</math><br/> <math>= \cos[(90^\circ - (x - 30^\circ))]</math><br/> <math>= \cos(120^\circ - x)</math><br/> <math>\therefore \frac{x}{2} = 120^\circ - x + 360^\circ \cdot k</math><br/> <math>x = 240^\circ - 2x + 720^\circ \cdot k</math><br/> <math>x = 80^\circ + 240^\circ \cdot k</math><br/> OR<br/> <math>\frac{x}{2} = 360^\circ - (120^\circ - x) + 360^\circ \cdot k</math><br/> <math>\frac{x}{2} = 360^\circ - 120^\circ + x + 360^\circ \cdot k</math><br/> <math>\frac{x}{2} = 240^\circ + x + 360^\circ \cdot k</math><br/> <math>x = 480^\circ + 2x + 720^\circ \cdot k</math><br/> <math>-x = 480^\circ + 720^\circ \cdot k</math><br/> <math>\therefore x = -480^\circ - 720^\circ \cdot k</math> where/waar <math>k \in \mathbb{Z}</math><br/> <math>x_A = -160^\circ</math> and/en <math>x_B = 80^\circ</math> </p> | <p>✓ <math>\cos(120^\circ - x)</math></p> <p>✓ <math>80^\circ + 240^\circ \cdot k</math></p> <p>✓ <math>240^\circ + x + 360^\circ \cdot k</math></p> <p>✓ <math>-480^\circ - 720^\circ \cdot k</math></p> <p>✓ <math>x_A = -160^\circ</math></p> <p>✓ <math>x_B = 80^\circ</math></p> <p>(6)</p> |
| 8.2 | <p><math>-150^\circ &lt; x &lt; 30^\circ</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>✓ ✓ Critical values</p> <p>✓ Notation (3)</p>                                                                                                                                                                                                                                                 |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[9]</b>                                                                                                                                                                                                                                                                                       |

**QUESTION/VRAAG 9**

|       |                                                                                                                                                                                                                                                                                                      |                                                                                                               |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 9.1   | $AB^2 = AO^2 + BO^2 - 2(AO)(BO) \cos \hat{O}_1$<br>$\left(\frac{3}{2}x\right)^2 = x^2 + x^2 - 2x^2 \cos \hat{O}_1$<br>$\frac{9}{4}x^2 - 2x^2 = -2x^2 \cos \hat{O}_1$<br>$\cos \hat{O}_1 = \frac{1}{4}x^2 \div 2x^2$<br>$= \frac{1}{8}$<br>$\therefore \hat{O}_1 = 97^\circ$                          | ✓ cosine rule<br>✓ substitution<br>✓ simplification<br><br>✓ $\frac{1}{8}$<br>✓ $\hat{O}_1 = 97^\circ$<br>(5) |
| 9.2   | $\hat{C} = 48,5^\circ$ angle at centre/ <i>hoek by middelpunt</i> =<br>twice angle at circ/ <i>twee keer hoek by sirk</i><br>$\hat{B}_1 + \hat{B}_2 = 83^\circ$ int angles of/ <i>binne hoeke van</i> $\Delta$<br>$\frac{AC}{\sin 83^\circ} = \frac{15}{\sin 48,5^\circ}$<br>$\therefore AC = 19,88$ | ✓ S<br>✓ S<br>✓ sine rule<br>✓ $AC = 19,88$<br>(4)                                                            |
| 9.3.1 | $\hat{Q}_1 = 32^\circ$ tan chord theorem/ <i>tan koordstelling</i>                                                                                                                                                                                                                                   | ✓ ✓ S/R<br>(2)                                                                                                |
| 9.3.2 | $\hat{Q}_1 = \hat{P}_4 = 32^\circ$ angle opp = sides/ <i>hoeke teenoor</i> = sye                                                                                                                                                                                                                     | ✓ ✓ S/R<br>(2)                                                                                                |
| 9.3.3 | $\hat{M}_1 = \hat{Q}_1 + \hat{P}_4$ ext angle of $\Delta$ = op pint angles/<br><i>Verl hoek van</i> $\Delta$ = <i>opp hoeke</i><br>$= 32^\circ + 32^\circ$<br>$\therefore \hat{M}_1 = 64^\circ$                                                                                                      | ✓ S<br><br>✓ answer<br>(2)                                                                                    |
| 9.3.4 | $\hat{S} = 180^\circ - 122^\circ$ sum of angles of $\Delta = 180^\circ$ /<br><i>Som van hoeke van</i> $\Delta = 180^\circ$<br>$\therefore \hat{S} = 58^\circ$<br>But/ <i>Maar</i> $\hat{S} = \hat{R} = 58^\circ$ angle sub by same chord/<br><i>hoek verv by dieselfde koord</i>                     | ✓ ✓ S/R<br><br>✓ ✓ S/R<br>(4)                                                                                 |
|       |                                                                                                                                                                                                                                                                                                      | <b>[19]</b>                                                                                                   |

**QUESTION/VRAAG 10**

|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.1                                                                               | In the same proportion/<br><i>In dieselfde verhouding</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ✓ same proportion<br>(1)                                                                                                                                                                                                      |
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                               |
| 10.2                                                                               | <p>Const: Join KZ &amp; LY &amp; draw <math>h_1</math> from <math>K \perp XL</math> &amp; <math>h_2</math>/<br/> Konst: Verbind KZ &amp; LY &amp; skets <math>h_1</math> van <math>K \perp XL</math> &amp; <math>h_2</math><br/> Proof/Bewys</p> $\frac{\text{Area/Oppvl } \Delta XKL}{\text{Area/Oppvl } \Delta LYK} = \frac{\frac{1}{2} XK \times h_1}{\frac{1}{2} KY \times h_2} = \frac{XK}{KY}$ $\frac{\text{Area/Oppvl } \Delta XKL}{\text{Area/Oppvl } \Delta KLZ} = \frac{\frac{1}{2} XL \times h_2}{\frac{1}{2} LZ \times h_2} = \frac{XL}{LZ}$ <p>Area of <math>\Delta XKL</math> = Area <math>\Delta XKL</math>      common/<br/> Oppvl van <math>\Delta XKL</math> = Oppvl <math>\Delta XKL</math>      algemeen</p> <p>But Area <math>\Delta LKY</math> = Area <math>\Delta KLZ</math>    same base &amp;<br/> height; <math>LK \parallel YZ</math>/<br/> Maar Oppvl <math>\Delta LKY</math> = Oppvl <math>\Delta KLZ</math>    selfde basis &amp;<br/> hoogte; <math>LK \parallel YZ</math></p> $\frac{\text{Area/Oppvl } \Delta XKL}{\text{Area/Oppvl } \Delta LYK} = \frac{\text{Area/Oppvl } \Delta XKL}{\text{Area/Oppvl } \Delta KLZ}$ $\therefore \frac{XK}{KY} = \frac{XL}{LZ}$ | <p>✓ const</p> $\checkmark \frac{\text{Area } \Delta XKL}{\text{Area } \Delta LYK} = \frac{XK}{KY}$ $\checkmark \frac{\text{Area } \Delta XKL}{\text{Area } \Delta KLZ} = \frac{XL}{LZ}$ <p>✓ S ✓ R</p> <p>✓ S</p> <p>(6)</p> |



**QUESTION/VRAAG 11**

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                            |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.1 | <p>In <math>\triangle TPS</math> and <math>\triangle QSR</math></p> $\frac{PS}{QS} = \frac{1,5}{4} = \frac{3}{8}$ $\frac{TP}{SR} = \frac{4,5}{12} = \frac{3}{8}$ $\frac{TS}{QR} = \frac{3,6}{9,6} = \frac{3}{8}$ <p><math>\therefore \triangle TPS \sim \triangle QSR</math> sides of triangles in proportion<br/>syé van die driehoeke is in verhouding</p> <p><math>\therefore \hat{PTS} = \hat{R}</math></p> <p><math>\therefore TP</math> is a tangent converse of tan chord theorem/<br/>is 'n raaklyn teenoorg. van tan koordstelling</p> | $\checkmark \frac{PS}{QS} = \frac{1,5}{4}$ $\checkmark \frac{TP}{SR} = \frac{4,5}{12}$ $\checkmark \frac{TS}{QR} = \frac{3,6}{9,6}$ $\checkmark \checkmark S/R$ $\checkmark \hat{PTS} = \hat{R}$ $\checkmark R$ <p>(7)</p> |
| 11.2 | <p><math>\hat{P} = \hat{QSR}</math> <math>\triangle s \sim</math></p> <p><math>QS \parallel TP</math> corr angles =/korr hoeke</p> <p><math>\frac{TQ}{9,6} = \frac{1,5}{12}</math> proportional theorem/verhoudingstelling</p> <p><math>\therefore TQ = 1,2</math></p>                                                                                                                                                                                                                                                                          | $\checkmark S$ $\checkmark R$ $\checkmark \checkmark S/R$ $\checkmark TQ = 1,2$ <p>(5)</p>                                                                                                                                 |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[12]</b>                                                                                                                                                                                                                |

**TOTAL/TOTAAL: 150**