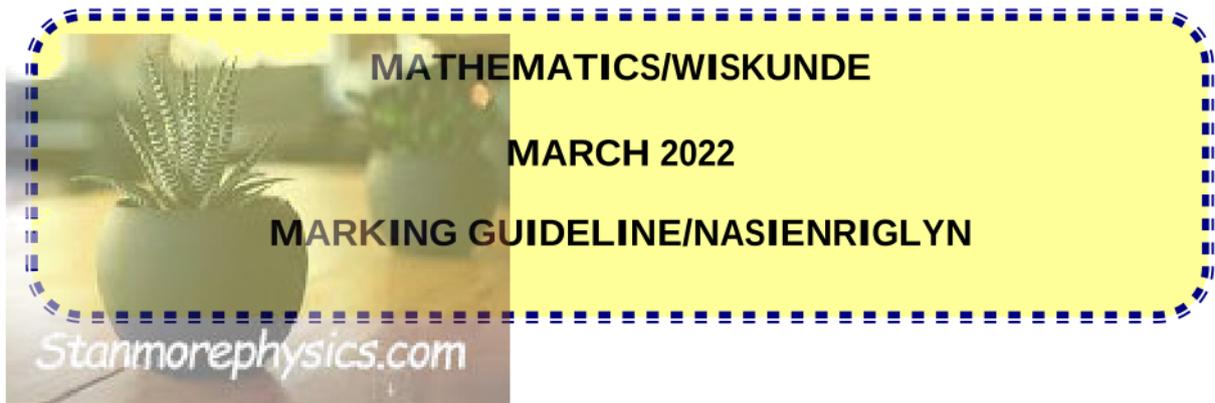




education

Department of
Education
FREE STATE PROVINCE

GRADE 11/GRAAD 11



MARKS: 50
PUNTE: 50

These marking guidelines consists of 6 pages.
Hierdie nasienriglyne bestaan uit 6 bladsye.

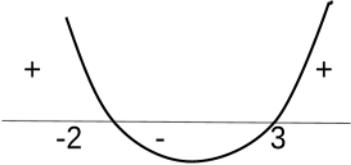
NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- CA applies in all aspects of the marking guideline.

LET WEL:

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.

QUESTION/VRAAG 1

1.1.1	$x = 2$ or $x = -7$	✓ $x = 2$ ✓ $x = -7$ (2)
1.1.2	$5x^2 - 3x - 1 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-3) \pm \sqrt{(-3)^2 - 4(5)(-1)}}{2(5)}$ $= \frac{3 \pm \sqrt{29}}{10}$ $= 0.84 \text{ or } x = -0.24$	✓ standard form ✓ correct formulae  ✓ subst into the correct formula ✓ both answers (4)
1.1.3	$(x - 3)(x + 2) < 0$ C.V $x = 3$ or $x = -2$  $-2 < x < 3$	✓ factors ✓ critical values ✓ answer (3)

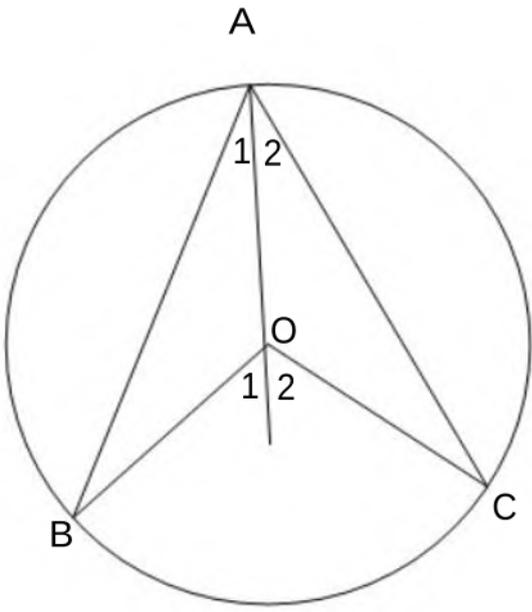
1.1.4	$2^x + 2^x \cdot 2^1 = 48$ $2^x(1+2) = 48$ $2^x = 16$ $2^x = 2^4$ $\therefore x = 4$	<ul style="list-style-type: none"> ✓ expansion ✓ common factor ✓ simplification ✓ answer <p style="text-align: right;">(4)</p>
1.1.5	$(\sqrt{2x-1})^2 = (x-2)^2$ $2x-1 = x^2 - 4x + 4$ $x^2 - 6x + 5 = 0$ $(x-5)(x-1) = 0$ $x = 5 \text{ or } x = 1$	<ul style="list-style-type: none"> ✓ squaring both sides ✓ standard form ✓ factors ✓ answer with selection <p style="text-align: right;">(4)</p>
1.2	$x = 2y - 6$ $(2y - 6)^2 + 2y(2y - 6) = 3y^2$ $4y^2 - 24y + 36 + 4y^2 - 12y - 3y^2 = 0$ $5y^2 - 36y + 36 = 0$ $(5y - 6)(y - 6) = 0$ $y = \frac{6}{5} \text{ or } y = 6$ <div style="background-color: yellow; padding: 5px; margin-top: 10px;"> $x = 2\left(\frac{6}{5}\right) - 6 \text{ or } x = 2(6) - 6$ $= -\frac{18}{5} \qquad \qquad \qquad = 6$ </div>	<ul style="list-style-type: none"> ✓ $x = 2y - 6$ ✓ subst ✓ simplification ✓ factors ✓ both y values ✓ both x values <p style="text-align: right;">(6)</p>

Question 2

<p>2.1.1</p>	$\frac{3^{2(x+1)} - 6 \cdot 3^{2x}}{\left(3^{\frac{1}{2}}\right)^{4x+1}}$ $= \frac{3^{2x+2} - 6 \cdot 3^{2x}}{3^{2x+\frac{1}{2}}}$ $= \frac{3^{2x}(3^2 - 6)}{3^{2x}\left(3^{\frac{1}{2}}\right)}$ $= \frac{3}{3^{\frac{1}{2}}}$ $= 3^{\frac{1}{2}} = \sqrt{3}$	<p>✓ prime factors</p> <p>✓ simplification</p> <p>✓ common factor</p> <p>✓ answer (4)</p>
<p>2.1.2</p>	$= \frac{2\sqrt{x^8x} - 4\sqrt{x^8x}}{\sqrt{x}}$ $= \frac{2x^4\sqrt{x} - 4x^4\sqrt{x}}{\sqrt{x}}$ $= \frac{-2x^4\sqrt{x}}{\sqrt{x}}$ $= -2x^4$	<p>✓ $\frac{2\sqrt{x^8x} - 4\sqrt{x^8x}}{\sqrt{x}}$</p> <p>✓ $\frac{2x^4\sqrt{x} - 4x^4\sqrt{x}}{\sqrt{x}}$</p> <p>✓ $\frac{-2x^4\sqrt{x}}{\sqrt{x}}$</p> <p>✓ answer (4)</p>
<p>2.2</p>	$1 = kx^2 - kx + k$ $0 = kx^2 - kx + k - 1$ $\Delta = 0$ $b^2 - 4ac = 0$	<p>✓ standard form</p>

	$(-k)^2 - 4(k)(k-1) = 0$ $k^2 - 4k^2 + 4k = 0$ $-3k^2 + 4k = 0$ $k(-3k + 4) = 0$ $k = 0 \text{ or } k = \frac{4}{3}$ $\therefore \Delta > 0$ $0 < k < \frac{4}{3}$	<p>✓ correct subt</p> <p>✓ factors</p> <p>✓ $\Delta > 0$</p> <p>✓ answer</p> <p style="text-align: right;">(5)</p>

Question 3

3.1.1	Supplementary or sum up to 180°	✓ answer
3.2	 <p>Join AO</p> <p>In $\triangle AOB$</p>	<p>✓ Construction</p> <p>Join AO</p>

	$\hat{O}_1 = \hat{A}_1 + \hat{B}$ ext \angle of Δ But $\hat{A}_1 = \hat{B}$ =radii(OA=OB) $\therefore \hat{O}_1 = 2\hat{A}_1$ Similarly in ΔAOC $\hat{O}_2 = \hat{A}_2 + \hat{C}$ ext \angle of Δ But $\hat{A}_2 = \hat{C}$ $\therefore \hat{O}_2 = 2\hat{A}_2$ $\therefore \hat{O}_1 + \hat{O}_2 = 2\hat{A}_1 + 2\hat{A}_2$ $\hat{B}\hat{O}\hat{C} = 2(\hat{A}_1 + \hat{A}_2)$ $\therefore \hat{B}\hat{O}\hat{C} = 2 \times \hat{B}\hat{A}\hat{C}$	✓S/R ✓S ✓S ✓S (5)
3.3.1	$\hat{C}\hat{O}\hat{B} = 2(51^\circ) = 102^\circ$ \angle at the $\square = 2 \times \angle$ at circum	✓S ✓R
3.3.2	$\hat{A}_2 = 39'$ \angle in $\frac{1}{2}$ \square	✓S ✓R
3.3.3	$\hat{D} = 180^\circ - (90^\circ + 29^\circ) = 61^\circ$ sum of \angle in Δ	✓S/R
3.3.4	In $\Delta \hat{C}\hat{O}\hat{B}$ $CF = \frac{1}{2}(24)$ line from centre to midpoint $OC^2 = CF^2 + OF^2$ pyth theorem $13^2 = 12^2 + OF^2$ $OF^2 = 169 - 144$ $OF^2 = 25$ $OF = 5m$	✓S/R ✓Subst into pyt ✓answer