HOËRSKOOL JOHAN JURGENS

MATHEMATICS

GRADE 11: CYCLE TEST **FEB 2026** TERM 1

TIME: 1 HOUR **TOTAL MARKS**: 50

EXAMINER: Z CRONJE **MODERATOR:** M BOTHA

INSTRUCTIONS TO LEARNERS:

1. There are TWO questions and 2 pages. Answer all the questions.
2. Make sure your answers are neat and legible. Write with ONLY a blue pen OR a black pen.
3. Use the same numbering system as on the question paper.
4. Show all the calculations and diagrams you use to obtain the answer where necessary.
5. A non-programmable, non-graphical scientific calculator may be used.
6. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.

This paper consists of 3 pages and 2 questions, including an information sheet.

QUESTION 1

11 Solve for x:

1.1.1 $x(x-1)(3x+1)=0$ (3)

1.1.2 $2x^2-3x=0$ (2)

1.1.3 $(x+3)(x-1)=-x+1$ (4)

1.1.4 $3x^2-4x=5$ (round of to one decimal place) (4)

1.1.5 $x^2>3(x+6)$ (4)

1.1.6 $\mathrm{x}^2+3\mathrm{x}-\frac{9}{\mathrm{x}^2+3\mathrm{x}}=8$ (5)

1.2 What is the value of d if $(2x-3)$ is a factor of $6x^2+dx-12$? (2)

1.3 Solve for x and y simultaneously if: $2x+y=3$ and $2y+2x^2-5=-x$ (4)

[28]

QUESTION 2

2.1 Solve for x:

2.1.1 $x^{-\frac{3}{4}}=27$ (2)

2.1.2 $3^{2x+1}+4.3^{2x}=21$ (4)

2.1.3 $\frac{54^m-18^{m-1}.3^{m+1}}{(3^{m-1})^2.6^m}$ (6)

2.2 Simplify:

2.2.1 $\sqrt[3]{125x^6}-\sqrt[4]{81x^8}+\sqrt{36x^4}$ (4)

2.2.2 $\sqrt{x-1}+3=x$ (3)

2.2.3 $\frac{y-25}{\sqrt{y}+5}$ (3)

[22]

Total: [50]

INFORMATION SHEET

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$A = P(1 + ni) \qquad A = P(1 - ni) \qquad A = P(1 + i)^n \qquad A = P(1 - i)^n$$

$$T_n = a + (n - 1)d \qquad S_n = \frac{n}{2}[2a + (n - 1)d]$$

$$T_n = ar^{n-1} \qquad S_n = \frac{a(r^n - 1)}{r - 1};\ r \neq 1 \qquad S_\infty = \frac{a}{1 - r};\ -1 < r < 1$$

$$F = \frac{x[(1+i)^n - 1]}{i} \qquad P = \frac{x[1 - (1+i)^{-n}]}{i}$$

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \qquad M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$$

$$y = mx + c \qquad y - y_1 = m(x - x_1) \qquad m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \tan\theta$$

$$(x - a)^2 + (y - b)^2 = r^2 \qquad \text{In } \Delta ABC: \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{In } \Delta ABC: a^2 = b^2 + c^2 - 2bc.\cos A \qquad \text{Area } \Delta ABC = \frac{1}{2}ab.\sin C$$

$$\sin(\alpha + \beta) = \sin\alpha.\cos\beta + \cos\alpha.\sin\beta \qquad \sin(\alpha - \beta) = \sin\alpha.\cos\beta - \cos\alpha.\sin\beta$$

$$\cos(\alpha + \beta) = \cos\alpha.\cos\beta - \sin\alpha.\sin\beta \qquad \cos(\alpha - \beta) = \cos\alpha.\cos\beta + \sin\alpha.\sin\beta$$

$$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha \quad / \quad 1 - 2\sin^2\alpha \quad / \quad 2\cos^2\alpha - 1 \qquad \sin 2\alpha = 2\sin\alpha.\cos\alpha$$

$$\bar{x} = \frac{\Sigma x}{n} \qquad \sigma^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}$$

$$P(A) = \frac{n(A)}{n(S)} \qquad P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$\hat{y} = a + bx \qquad b = \frac{\Sigma(x - \bar{x})(y - \bar{y})}{\Sigma(x - \bar{x})^2}$$