



HOËRSKOOL JOHAN JURGENS

MATHEMATICS

GRADE 10: EXAMINATION PAPER 2

NOV 2025 TERM 4

TIME: 2 HOURS

TOTAL MARKS: 100

EXAMINER: Z CRONJE

MODERATOR: M BOTHA

Instructions to Learners:

1. Please write your name, surname, grade, and date on the answer sheet.
2. Read all questions carefully and think before your answer.
3. Clearly show ALL calculations, diagrams, graphs, etcetera that you have used in determining the answers.
4. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
6. Diagrams are NOT necessarily drawn to scale.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write with a black or blue pen and cross out with a pencil if you make a mistake.
9. Please write neatly and legibly.
10. Good luck!!!!

This paper consists of 8 pages and 7 questions including an information sheet.

QUESTION 1

The marks (as a percentage) of 15 learners attained in a Mathematics exam are given below:

56	67	49	87	59	77	40	28	69	95	35	76	77	48	52
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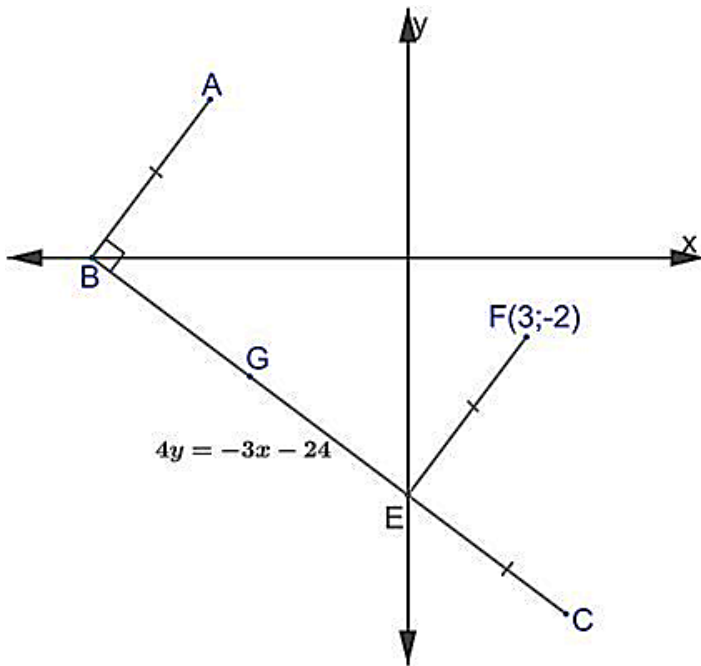
- 1.1 Write down the modal percentage. (1)
- 1.2 Determine then median percentage. (2)
- 1.3 Calculate the mean percentage. (3)
- 1.4 Determine the interquartile range of the marks. (4)
- 1.5 The teacher accidentally misplaced a 16th learner's script. After recalculating, the new mean is 63% Determine the additional learner's percentage. (4)

[14]

QUESTION 2

In the diagram below $AB \perp BC$, $AB = EF = EC$. G is the midpoint of BE.

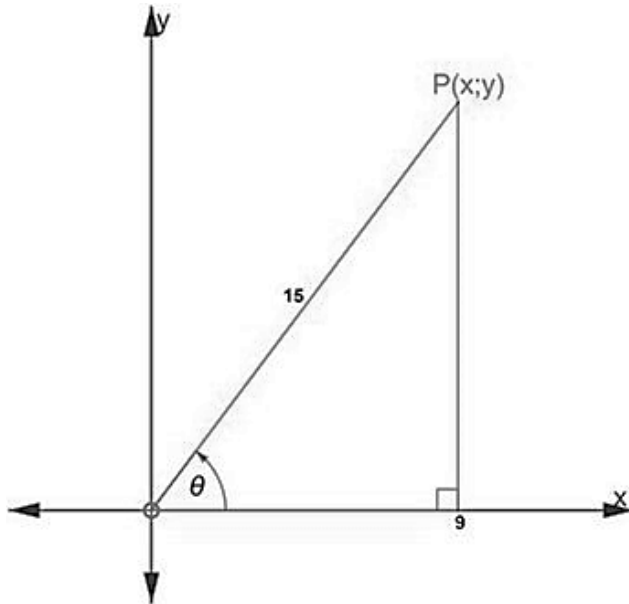
B and E are the intercepts of BC with equation $4y = -3x - 24$



- 2.1 Determine the coordinates of B and E. (4)
- 2.2 Determine coordinates of G, the midpoint of BE. (2)
- 2.3 Write down the gradient of BC. (1)
- 2.4 Calculate the length of AB. (2)
- 2.5 Determine the length of BC. (2)
- 2.6 Determine the gradient of AB. (2)
- 2.7 Prove that $AB \parallel EF$. (3)
- [16]**

QUESTION 3

- 3.1 Consider point $P(x; y)$ which is drawn in the first quadrant of the Cartesian plane and answer the questions that follow.



Determine the:

- 3.1.1 y -coordinate of P (3)
- 3.1.2 value of $\sin \theta$ (2)
- 3.1.3 value of $\tan \theta$ (2)

3.2 Simplify the following expression, WITHOUT using a calculator:

$$\frac{\tan 45^\circ}{\cos 60^\circ \cdot \sin 30^\circ} \quad (4)$$

3.3 Determine the solution of θ , $\theta \in [0^\circ; 90^\circ]$

3.3.1 $7 \tan \theta - 1 = 0$ (2)

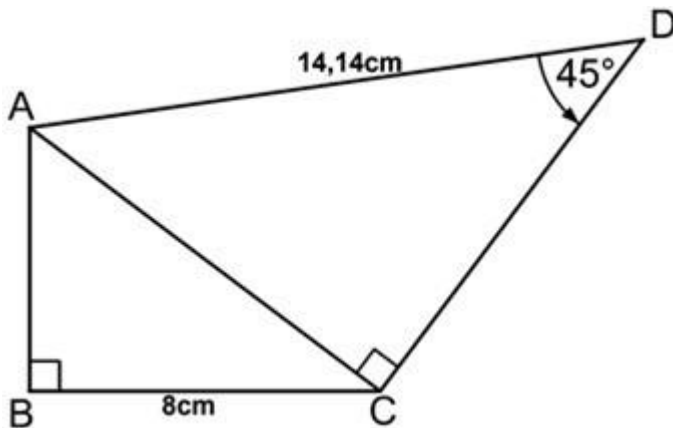
3.3.2 $\frac{\sin 2\theta}{\sqrt{3}} = \frac{1}{3}$ (2)

[15]

QUESTION 4

The diagram below shows right-angled $\triangle ABC$ and $\triangle ACD$.

$BC = 8\text{cm}$, $AD = 14,14\text{cm}$ and $\hat{D} = 45^\circ$



Determine the:

4.1 size of \hat{CAD} (2)

4.2 length of CD (3)

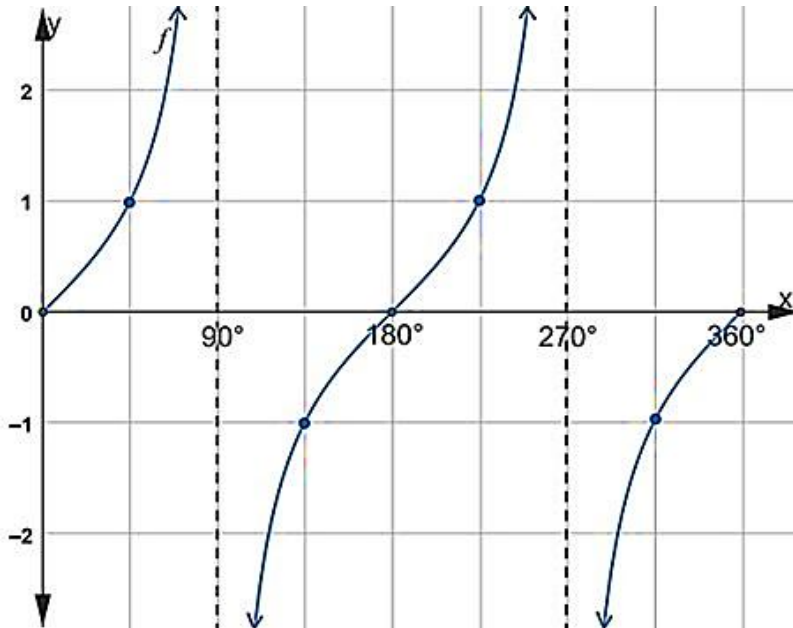
4.3 length of AB (3)

4.4 size of \hat{BAC} (3)

[11]

QUESTION 5

The graph of $f(x) = a \tan x, x \in [0^\circ; 360^\circ]$ is drawn below. Study the graph and answer the questions that follow.



- 5.1 Write down the:
- 5.1.1 value of a . (1)
 - 5.1.2 period of f . (1)
 - 5.1.3 domain of f . (3)
- 5.2 Determine the value(s) of x for which $f(x) < 0$. (2)
- 5.3 Consider the graph of $g(x) = \sin x$.
- 5.3.1 Determine the value(s) of x for which $f(x) = g(x), x \in [0^\circ; 360^\circ]$. (4)
 - 5.3.2 Draw the graph of $g, x \in [0^\circ; 360^\circ]$ on the same Cartesian plane on THE ANSWER SHEET. Show ALL intercepts with the axes and turning points. (4)
 - 5.3.3 Write down the range of g . (2)

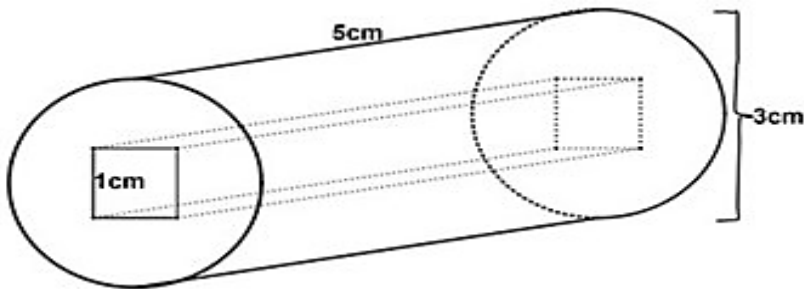
[17]

QUESTION 6

The cylindrical metal piece below has a rectangular hole through the middle. The perimeter of the hole is a square with side 1 cm, the height of the cylinder is 5 cm and the diameter of its base is 3 cm. You may use the following formulae:

$$\text{Volume of a rectangular prism} = l \times b \times h$$

$$\text{Volume of a cylinder} = \pi r^2 h$$



Determine the volume of metal required for the piece.

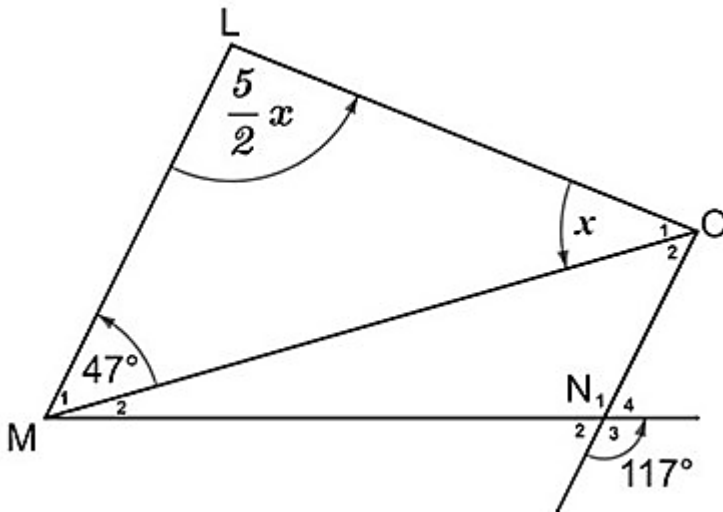
(7)

[7]

QUESTION 7

In the diagram below, LMNO is a trapezium.

- $\hat{M}_1 = 47^\circ$, $\hat{N}_3 = 117^\circ$, $\hat{O}_1 = x$ and $\hat{L} = \frac{5}{2}x$



- 7.1 Write down ONE property of a trapezium. (1)
- 7.2 Prove, with reasons that $\hat{O}_2 = \hat{M}_1$ (2)
- 7.3 Determine, with reasons, the size of:
- 7.3.1 \hat{N}_1 (3)
- 7.3.2 \hat{N}_4 (3)
- 7.3.3 \hat{M}_2 (5)
- 7.4 Determine, with reasons, the size of \hat{L} . (6)
- [20]**

TOTAL: 100

INFORMATION SHEET

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

$$A = P(1 + ni)$$

$$A = P(1 - ni)$$

$$A = P(1 + i)^n$$

$$A = P(1 - i)^n$$

$$T_n = a + (n - 1)d$$

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

$$T_n = ar^{n-1}$$

$$S_n = \frac{a(r^n - 1)}{r - 1};$$

$r \neq 1$

$$S_\infty = \frac{a}{1 - r}; -1 < r < 1$$

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

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

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

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$M \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$y = mx + c$$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \tan \theta$$

$$(x - a)^2 + (y - b)^2 = r^2$$

$$\text{In } \triangle ABC: \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{In } \triangle ABC: a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

$$\text{Area } \triangle ABC = \frac{1}{2} ab \cdot \sin C$$

$$\sin(\alpha + \beta) = \sin \alpha \cdot \cos \beta + \cos \alpha \cdot \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cdot \cos \beta - \cos \alpha \cdot \sin \beta$$

$$\cos(\alpha + \beta) = \cos \alpha \cdot \cos \beta - \sin \alpha \cdot \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cdot \cos \beta + \sin \alpha \cdot \sin \beta$$

$$\cos^2 \alpha - \sin^2 \alpha$$

$$\cos 2\alpha = 1 - 2\sin^2 \alpha$$

$$\sin 2\alpha = 2\sin \alpha \cdot \cos \alpha$$

$$2\cos^2 \alpha - 1$$

$$\bar{x} = \frac{\Sigma x}{n}$$

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

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$\hat{y} = a + bx$$

$$b = \frac{\Sigma (x - \bar{x})(y - \bar{y})}{\Sigma (x - \bar{x})^2}$$