higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICS

(Second paper)

NQF LEVEL 2

(10501042)

17 February 2025 (X-paper)
09:00–12:00

Non-programmable scientific calculators and protractors may be used.

This question paper consists of 5 pages, 1 formula sheet and 2 addenda.

025Q2S2517

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
MATHEMATICS
(Second paper)
NQF LEVEL 2
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Write your name and other information in the appropriate spaces on the ANSWER BOOK.
2. Answer all questions in the ANSWER BOOK.
3. Start each question on a new page in the ANSWER BOOK.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Leave one line between two sub-questions, for example between QUESTION 2.1 and QUESTION 2.2.
6. You may use appropriate mathematical instruments.
7. You are advised to use the attached ADDENDA where applicable.
8. Show all formulae and substitutions in all calculations.
9. Round off your final numerical answers to a minimum of THREE decimal places where applicable, unless stated otherwise.
10. Use only a black or blue pen.
11. Write neatly and legibly.

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QUESTION 1

1.1 Differentiate between *mean* and *mode*. (4)

1.2 The data below show the mathematics assignment marks for Level 2 learners:

17	47	27	62	55	63	40	30	41	47	23
35	66	50	30	19	47	33	25	55	39	56

1.2.1 Construct a stem and leaf diagram. (6)

1.2.2 Determine the mean of the given data. (2)

1.2.3 Determine the median value of the data. (2)

1.2.4 Write down the mode value of the given data. (1)

1.2.5 Write down the maximum value and the minimum value. (2)

1.2.6 Determine the range. (2)

1.2.7 Determine the lower quartile. (3)

1.2.8 Determine the upper quartile. (3)

1.3 Given the following set of data:

65; 15; 44; 13; 74; 38; 24; 24; 11

What will be the 57^{th} percentile be? (4)

1.4 The table is provided in ADDENDUM A(attached). Please study and complete the table as instructed in ADDENDUM A, and ensure you follow all instructions outlined in the ADDENDUM.

1.4.1

Subject	Tally	Frequency
Maths		11
English	~~IIII~~ llll	
Science		13
Technology	~~IIII~~ ll	
Chemistry		15

(5)

1.4.2 Calculate the total frequency of all subjects by completing the table. (1)

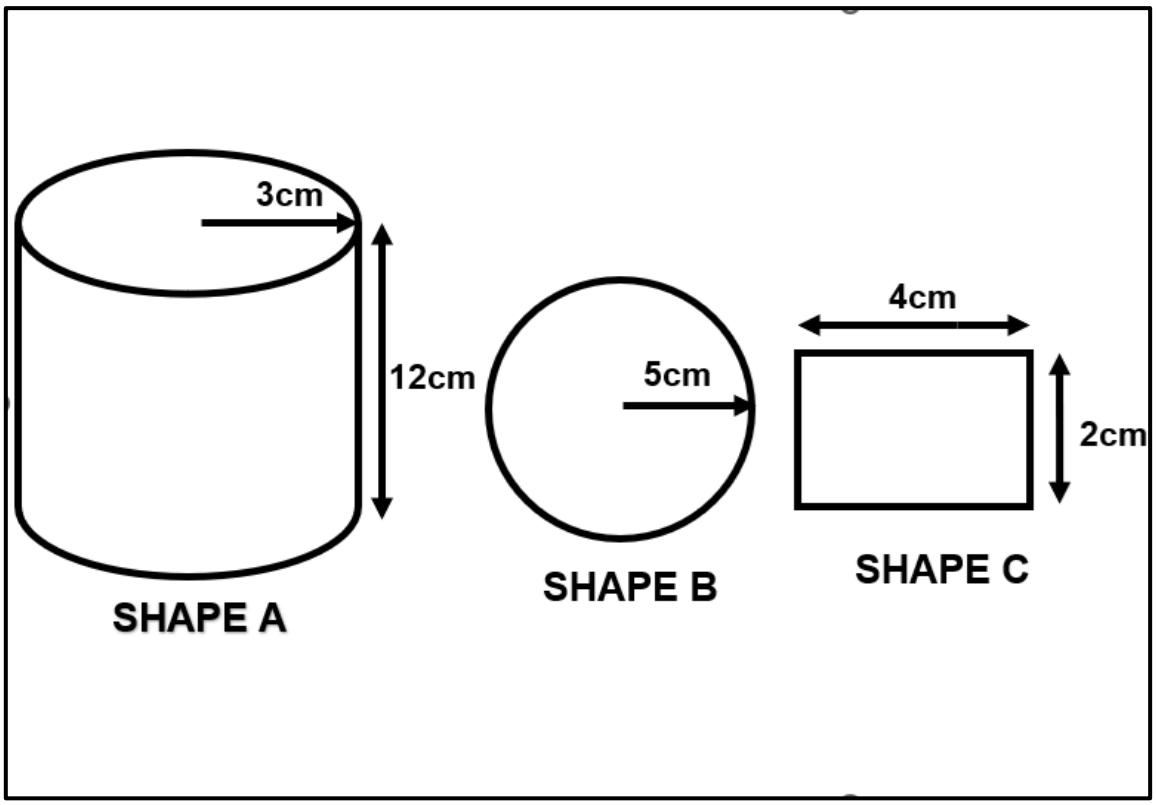
1.4.3 Use the information in question 1.4.1 and 1.4.2 to draw a bar chart on ADDENDUM A. (5)

[40]

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QUESTION 2

2.1 Consider the figure below. The radius and height of Shape A are respectively 3cm and 12 cm while the radius of Shape B is 5cm. The length and breadth of Shape C are respectively 4cm and 2cm.



2.1.1 Calculate the surface area of shape A (3)

2.1.2 Calculate the volume of shape A. (3)

2.1.3 Calculate the total area of shape B and C. (4)

2.2 Given: ΔABC with vertices A (-3; 4), B (-4; 1) and C (3; 2) respectively.

2.2.1 Draw ΔABC on your own Cartesian plane in your ANSWER BOOK (3)

2.2.2 Calculate the length of AC. (3)

2.2.3 Calculate the gradient of AC. (3)

2.3 Given the ΔABC with vertices A (3; 3), B (5; 6) and C (7; 3).

Find the coordinates A, B and C if ΔABC is reflected about the *y*-axis. (6)

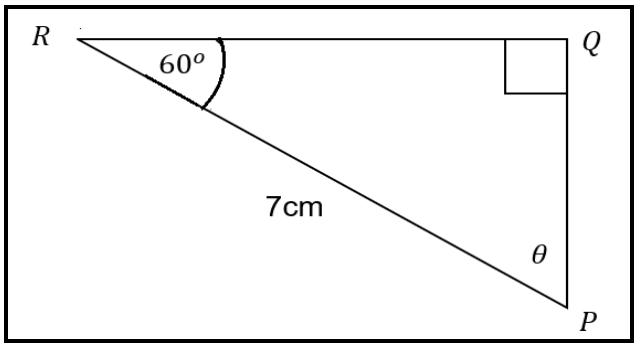
2.4 What is the midpoint of line segment AB where point A is at (6; 8) and B is (3; 1)? (5)

[30]

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QUESTION 3

3.1 The figure below shows ΔRQP with $\hat{R} = 60^o$, $\hat{P} = \theta$ and $RP = 7cm$



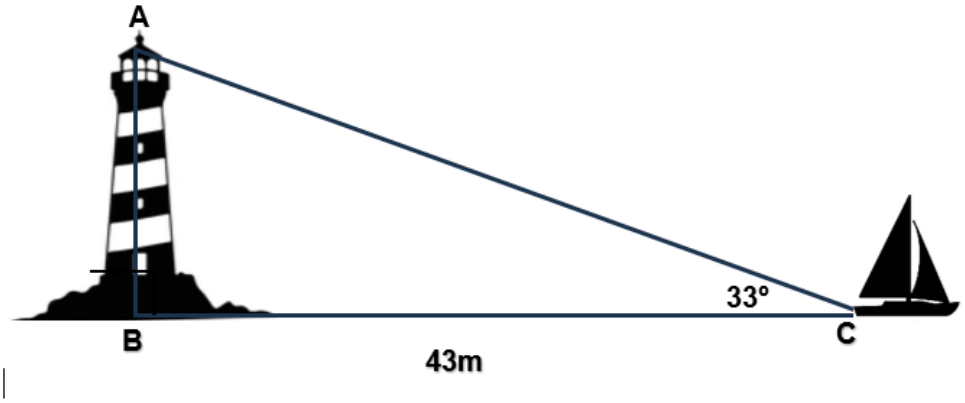
3.1.1 Calculate for θ. (2)

3.1.2 Determine the length of PQ and RQ. (6)

3.2 Solve for θ, where $\theta \leq 90^o$: If $\sin\theta = \cos\theta$ (4)

3.3 Determine the value of $\cos\theta + (\sin\theta)^2$, if $\sin\theta = \frac{1}{\sqrt{2}}$ (4)

3.4 From the top of a lighthouse the angle of depression to the boat is 33^o. The boat is 43m from the foot of the lighthouse. Calculate AB, the height of the lighthouse.



(3)

3.5 3.5.1 Draw the graph of $f(x) = 3\cos x$ and $g(x) = \sin x$ on the same system of axis, where $0^o \leq x \leq 360^o$ on ADDENDUM B (attached). Complete the table of values for $f(x)$ and $g(x)$ to help you draw the graphs. (6)

3.5.2 What is the range and domain of $f(x) = 3\cos x$? (2)

3.5.3 What is the period of $g(x) = \sin x$? (1)

3.5.4 What is the amplitude of $f(x) = 3\cos x$? (2)

[30]

TOTAL: 100

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(10501042)

FORMULA SHEET

1. $A_{square} = l \times l = l^2$
2. $A_{rectangle} = l \times w$
3. $A_{triangle} = \frac{1}{2} b \times h$
4. $A_{circle} = \pi r^2$
5. $C = 2\pi r$
6. $Area\ of\ parallelogram = base\ \times perpendicular\ height$
7. $A_{hexagon} = \frac{3\sqrt{3}}{2} L^2$
8. $A_{hexagon} = \frac{\sqrt{3}}{2} W^2$
9. $A_{cylinder} = 2\pi r(h + r)$
10. $Volume = Area\ of\ base\ \times perpendicular\ height$
11. $V_{cylinder} = \pi r^2 h$
12. $Total\ surface\ area\ of\ a\ triangular\ prism = (height\ of\ prism \times perimeter\ of\ base) + 2(area\ of\ base)$
13. $m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$
14. $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
15. $M = \left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$
16. $\theta = \tan^{-1} m$
17. $\bar{x} = \sum \frac{f_i x_i}{n}$ ***OR*** $Mean = (total\ or\ sum\ of\ all\ items) \div (number\ of\ items)$
18. $R = X_n - X_1$ ***OR*** $Range = highest\ value - lowest\ value$
19. $Q_{jposition} = \frac{j}{4}(n + 1)$
20. $Interquartile\ range = upper\ quartile - lower\ quartile = (Q_3 - Q_1)$
21. $Semi - interquartile\ range = \frac{1}{2}(upperquartile - lowerquartile = \frac{Q_3 - Q_1}{2}$
22. $P_{jposition} = \frac{j}{100}(n + 1)$

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EXAMINATION NUMBER:

Detach the ADDENDUM and hand it in with the ANSWER BOOK

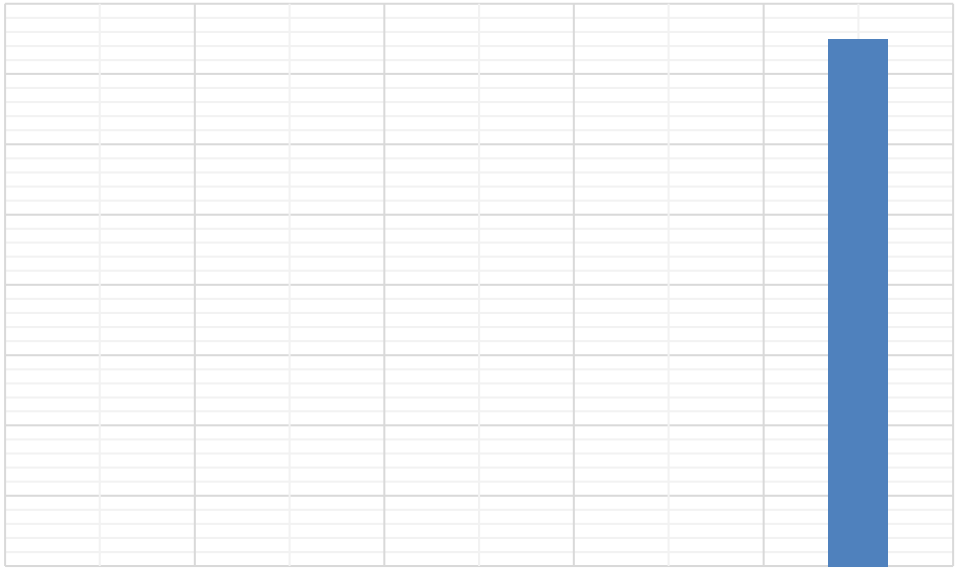
ADDENDUM A

1.4 1.4.1

Subject	Tally	Frequency
Maths		11
English	~~IIII~~ llll	
Science		13
Technology	~~IIII~~ ll	
Chemistry		15

(5)

1.4 1.4.3



(5)

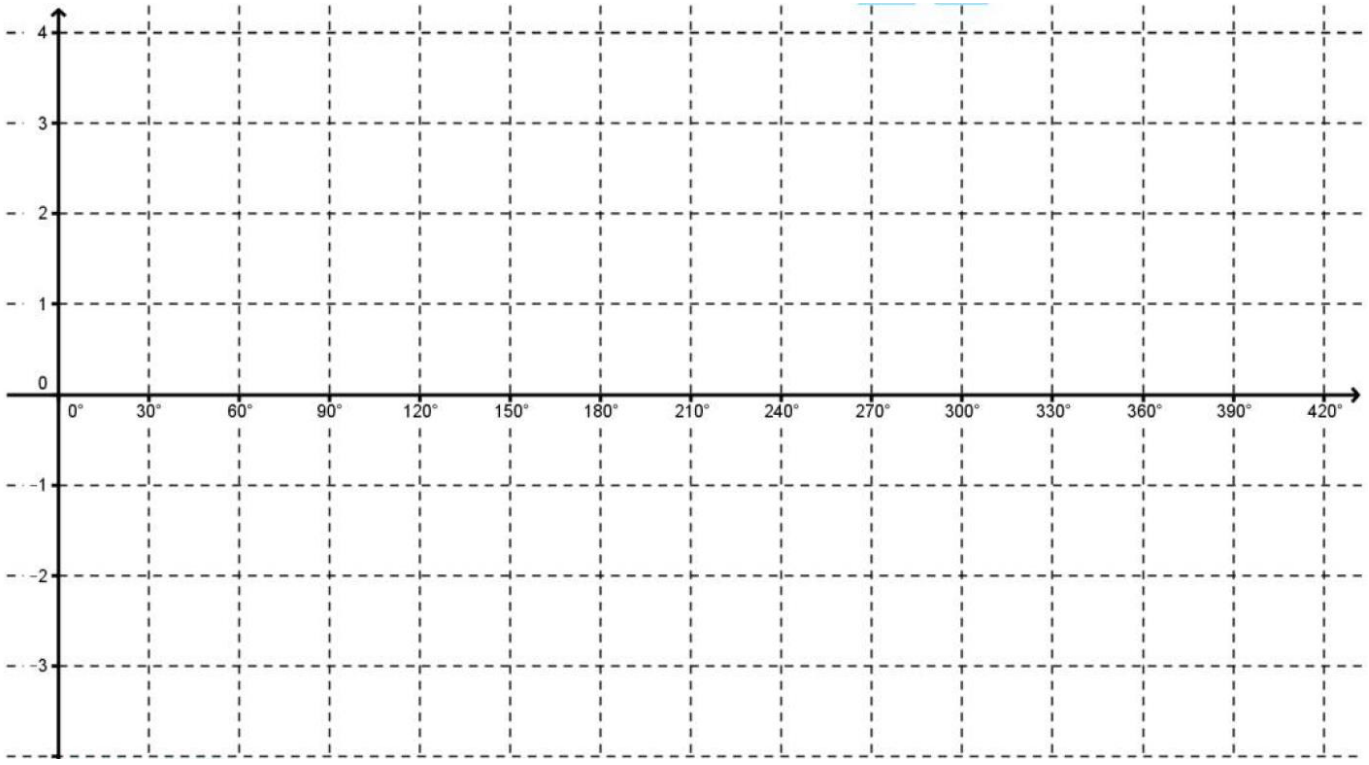
EXAMINATION NUMBER:

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ADDENDUM B

3.5 (8)

x	0^o	30^o	60^o	90^o	120^o	150^o	180^o	210^o	240^o	270^o	300^o	330^o	360^o
$f(x) = 3\cos x$													
$g(x) = \sin x$													



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