KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE



GRADE 10

MATHEMATICS PAPER 2

Stanmorephysics.com

NOVEMBER 2024

MARKS: **100**

TIME: **2 hours**

This question paper consists of 9 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 10 questions.
2. Answer ALL the questions.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
5. Answers only will NOT necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
8. Diagrams are NOT necessarily drawn to scale.
9. Write neatly and legibly.

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QUESTION 1

Amahle recorded the amount of data (in MB) that she had used daily in the past 15 days.

3	10	12	13	15	15	16	18	24	26	34	40	42	43	45

1.1 Calculate the range of the data. (2)

1.2 Calculate the mean data usage. (2)

1.3 Write down the five number summary of the data. (3)

1.4 Draw a box and whisker diagram to represent the data. (3)

1.5 Determine the interquartile range. (3)

[13]

QUESTION 2

The company HEALTHCRAZY conducted a survey at a gym in KwaZulu – Natal, to find out which age group most frequently uses their health supplements.

AGES	FREQUENCY
$20 \leq x < 30$	29
$30 \leq x < 40$	28
$40 \leq x < 50$	21
$50 \leq x < 60$	15
$60 \leq x < 70$	10
$70 \leq x < 80$	2

2.1 Identify the modal class for the data. (1)

2.2 Determine the interval in which the median lies. (1)

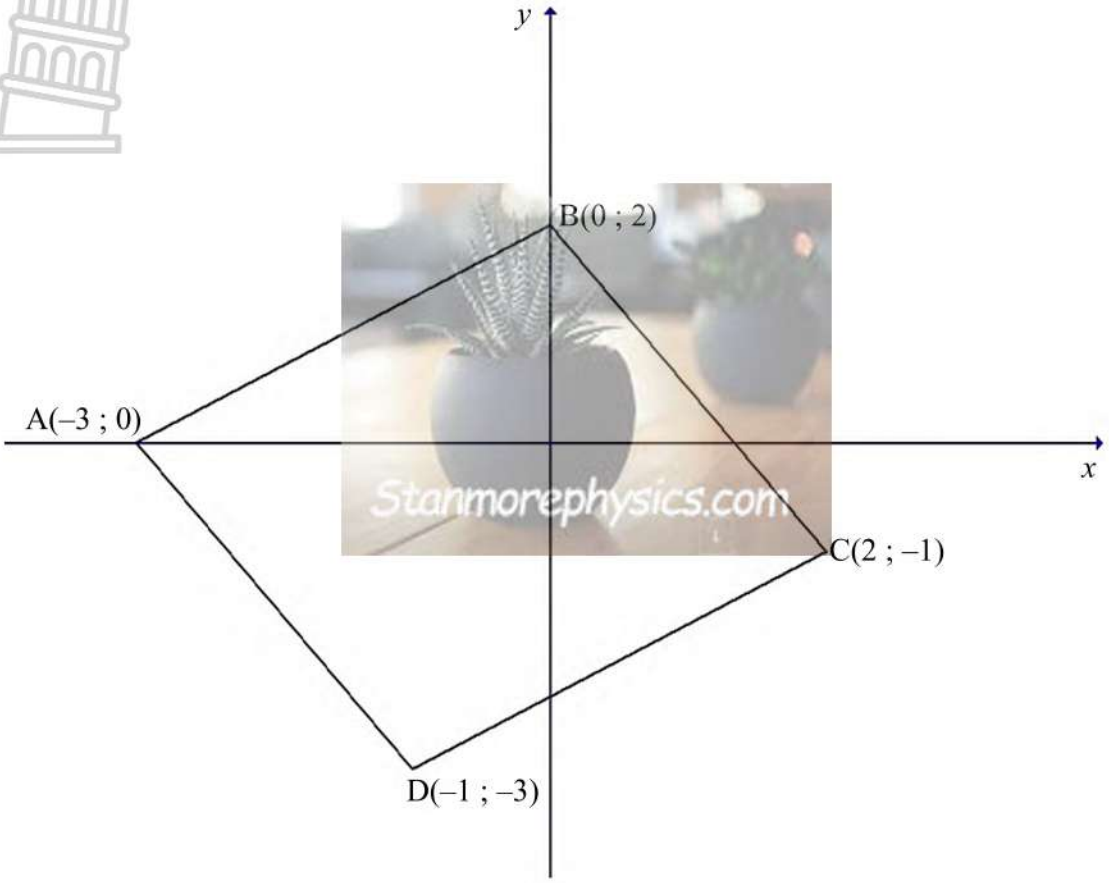
2.3 Estimate the mean age of the people that use the health supplements. (4)

[6]

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QUESTION 3

In the cartesian plane below, $A(-3;0)$, $B(0;2)$, $C(2;-1)$ and $D(-1;-3)$ are points on a quadrilateral.



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3.1 Determine the coordinates of R , the midpoint of AC. (3)

3.2 Calculate the gradient of the line AB. (2)

3.3 Calculate the length of AC. (3)

3.4 If ABCD is a rhombus, calculate the area of ABCD. (5)

[13]

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QUESTION 4

If $4\tan\theta = -3$ and $\cos\theta > 0$, WITHOUT using a calculator, determine the value of:

4.1 $\sin\theta$ (3)

4.2 $10\cos^2\theta$ (2)

4.3 $3\cot\theta + 5\sin\theta$ (3)

[8]

QUESTION 5

5.1 In each of the following equations, solve for x where $0^\circ < x < 90^\circ$. Give your answers correct to TWO decimal places.

5.1.1 $\cos x = \frac{2}{3}$ (2)

5.1.2 $\frac{4}{\cot x} + 1 = 3$ (3)

5.2 Simplify fully, WITHOUT the use of a calculator.

$$\frac{\tan 45^\circ . \text{cosec}\, 60^\circ}{\cot 30^\circ . \cos^2 45^\circ}$$ (5)

5.3 If $x = 56{,}3^\circ$ and $y = 97{,}5^\circ$, evaluate the following correct to TWO decimal places.

5.3.1 $\cos(x + y)$ (2)

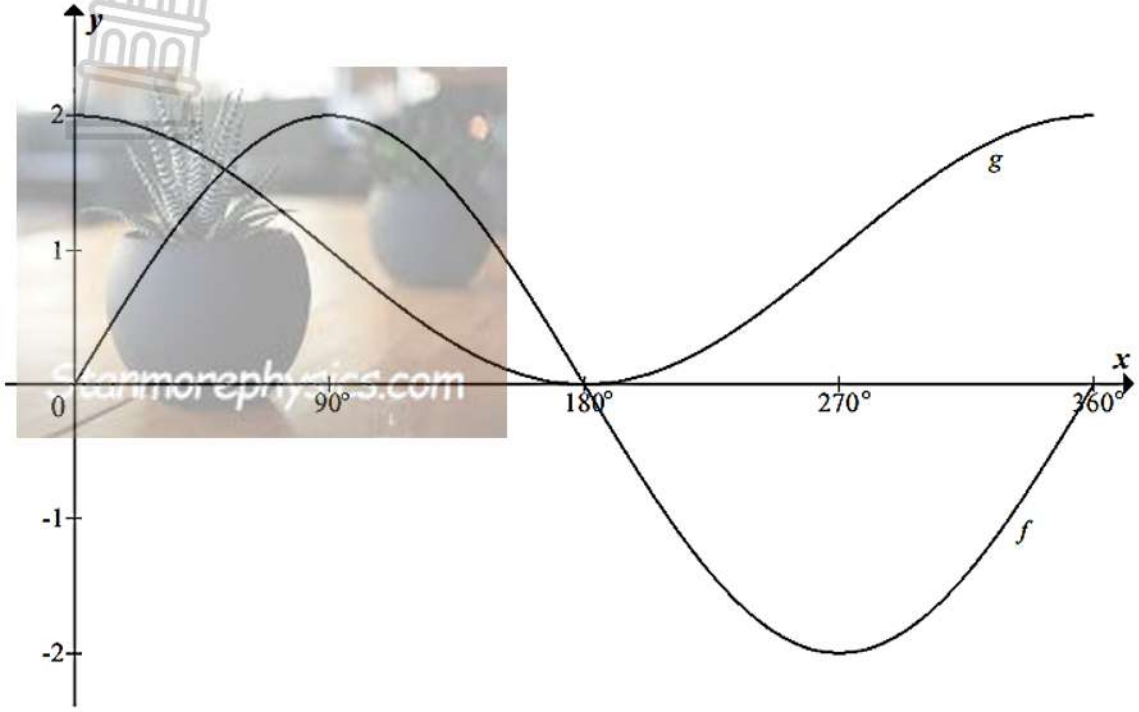
5.3.2 $\frac{2\sin^2 x - 2}{\cos y}$ (3)

[15]

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QUESTION 6

The graphs of $f(x) = p\sin x$ and $g(x) = \cos x + q$ for $x \in [0\ ;\ 360°]$ are sketched below:



6.1 Determine the value of p and q. (2)

6.2 Write down the amplitude of g. (1)

6.3 Write down the range of f. (2)

6.4 For which value(s) of x will $f(x) > 0$? (2)

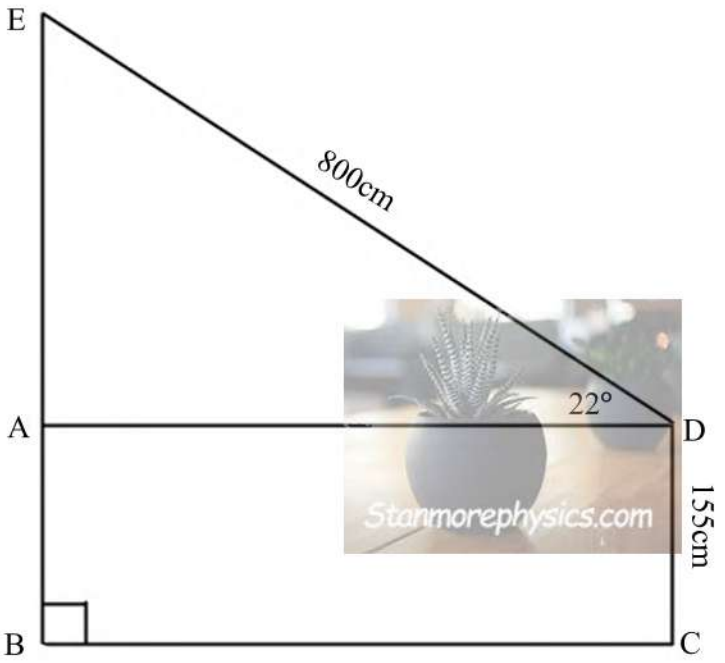
6.5 The graph of g is reflected about the x-axis and then shifted 2 units upwards to obtain the graph h. Write down the equation of h. (2)

[9]

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QUESTION 7

In the diagram below ABCD is a rectangle. DC = 155cm and DE = 800cm. The angle of elevation from D to E is 22°.



7.1 Calculate the length of BE. (4)

7.2 Determine the distance of BC. (3)

[7]

QUESTION 8

A metal marble has a diameter of 16 millimetres.



Volume of sphere $= \frac{4}{3}\pi r^3$

8.1 Calculate the volume of metal used to make this marble. Give your answer correct to TWO decimal places. (3)

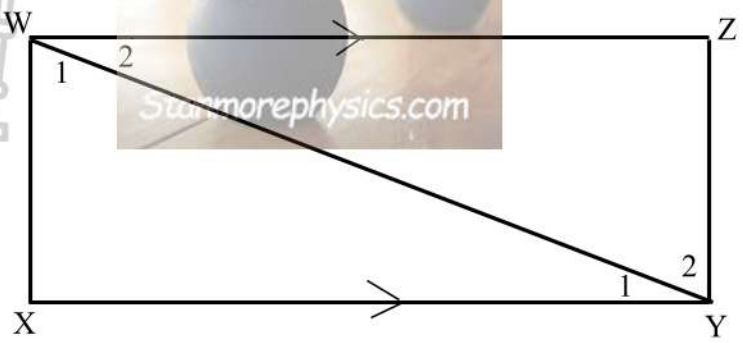
8.2 If the radius of the marble is doubled, write down the ratio of the new volume to the original volume. (3)

[6]

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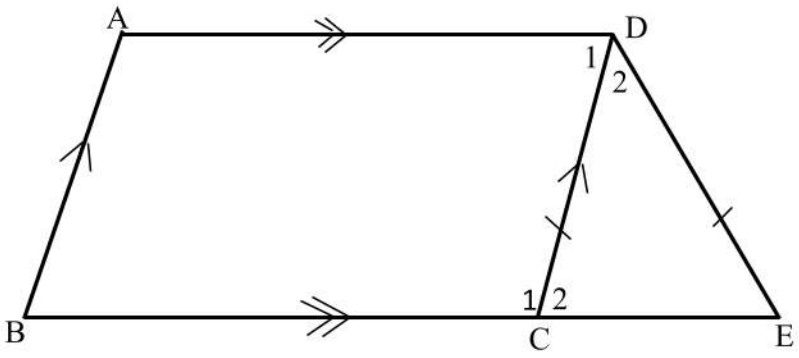
QUESTION 9

9.1 In quadrilateral WXYZ, $WZ \parallel XY$ and $\hat{X} = \hat{Z}$.



Prove that WXYZ is a parallelogram. (5)

9.2 In the sketch below, ABCD is a parallelogram. $DC = DE$ and $\hat{A} = 120°$.



9.2.1 Calculate the size of:

a) $\hat{B}$ (2)

b) $\hat{C}_2$ (2)

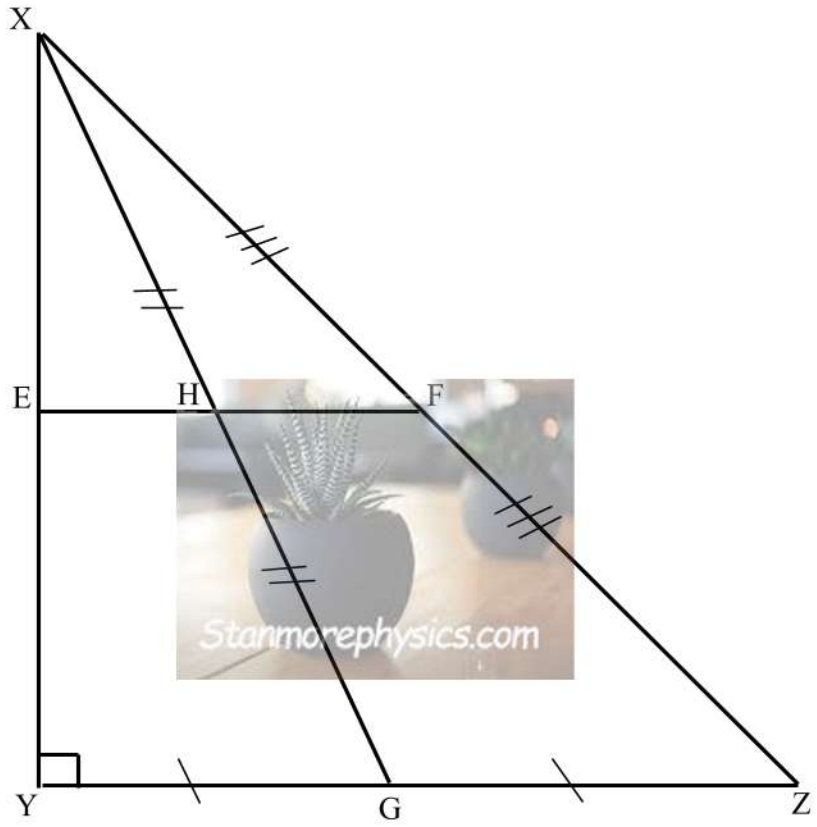
9.2.2 If $\hat{D}_2 = 4x$. Calculate the value of x. (4)

[13]

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QUESTION 10

ΔXYZ is right angled at Y. F and G are the midpoints of XZ and YZ respectively. H is the midpoint of XG. E lies on XY such that FHE is a straight line.



10.1 Prove that E is the midpoint of XY. (3)

10.2 If $EH = 3,5\text{cm}$ and the area of $\Delta HEX = 9,5\text{cm}^2$. Calculate the length of XY. (4)

10.3 Hence, calculate the area of ΔXYZ. (3)

[10]

TOTAL: 100

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