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N5

National Qualifications

2025

Mathematics

Paper 2

Wednesday, 14 May

Instructions to Candidates

Candidates should enter their surname, forename(s), date of birth, Scottish candidate number and the name and level of the subject at the top of their first answer sheet.

Total marks – 50

Attempt ALL Questions

You may use a calculator.

To earn full marks you must show your working in your answers.

State the units for your answer where appropriate.

Questions marked with an asterisk differ in some respects from those in the printed paper.

Write your answers clearly on your answer sheet.

You must clearly identify the question number you are attempting on your answer sheet.

Marks are shown in square brackets at the end of each question or part question.

An ow in the margin indicates a new question.

[Braille page 2] Tactile diagrams are supplied separately.

A separate formula sheet is provided.

[Braille page 3] TOTAL MARKS — 50

Attempt ALL questions

ow 1. The number of visitors to a zoo in 2024 was 118750.

The number of visitors is expected to increase by 4% each year over the next two years.

Calculate the expected number of visitors in 2026. [3 marks]

ow 2. Refer to the diagram for Question 2. A shop sells footballs in the shape of a sphere with diameter 21 centimetres.

Calculate the volume of the football.

Give your answer correct to 3 significant figures. [3 marks]

ow 3. The mass of one atom of gold is 3.27×10^{-22} grams.

The mass of one atom of carbon is 6.1% of the mass of an atom of gold.

Calculate the mass of one atom of carbon.

Give your answer in scientific notation. [2 marks]

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ow 4. The weights, in kilograms, of a sample of rugby players in Scotland are shown.

93 103 99 105 88 106 92

(a) Calculate the mean and standard deviation of these weights. [4 marks]

A sample of rugby players in France has a mean weight of 105 kilograms and a standard deviation of 5.9 kilograms.

(b) Make two valid comments comparing the WEIGHTS of the rugby players in the samples from Scotland and France. [2 marks]

ow 5. Express $x^2+10x+19$ in the form $(x+a)^2+b$. [2 marks]

ow 6. Refer to the diagrams for Question 6. A party hat is made in the shape of a cone, as shown by Diagram 6A.

The piece of card used for making the hat is a sector of a circle, centre C AS SHOWN BY DIAGRAM 6B.

The radius of the circle is 15 centimetres and angle ACB is 170°.

Calculate the area of the sector. [3 marks]

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ow 7. Refer to the diagram for Question 7. In the diagram, ABCDE is a regular pentagon.

• Angle EFA is 65°.

• FAB is a straight line.

Calculate the size of angle FEA. [2 marks]

ow * 8. On a rectangular cuboid, KLMNOPQR, the vertices L and R are on opposite faces and are diagonally opposite each other.

L has coordinates (0, 3, 12).

R has coordinates (4, 0, 0).

(a) State the dimensions of the cuboid. [1 mark]

(b) Calculate the length of the space diagonal LR. [3 marks]

ow 9. Change the subject of the formula

$B = \frac{1}{4}kc^2 - 3c$ to k . [3 marks]

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ow 10. On Bob's lorry there are 7 stacks of paving slabs and 3 stacks of edging blocks.

The total weight of these stacks is 2400 kilograms.

Let p be the weight of a stack of paving slabs and e be the weight of a stack of edging blocks.

(a) Write down an equation in p and e to illustrate this information. [1 mark]

Imran has 3 stacks of paving slabs and 4 stacks of edging blocks on his lorry.

The total weight of these stacks is 1300 kilograms.

(b) Write down an equation in p and e to illustrate this information. [1 mark]

Beth has 6 stacks of paving slabs and 5 stacks of edging blocks on her lorry.

(c) Calculate the TOTAL WEIGHT of the stacks of paving slabs and edging blocks on Beth's lorry. [4 marks]

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ow 11. Two model aircraft are mathematically similar.

The small model is 14 centimetres long, and the area of one wing is 24 square centimetres.

The large model is 31.5 centimetres long.

Calculate the AREA of one wing of the large model. [3 marks]

ow 12. Refer to the diagram for Question 12. In the diagram A, B and C represent the positions of three checkpoints in an orienteering course.

- B is 250 metres east of A.
- The bearing of C from A is 131°.
- C is 200 metres from B.

Calculate the bearing of C from B.

Do not use a scale drawing. [4 marks]

ow 13. Solve the equation

$\frac{5x+1}{2} = \frac{4x}{3} + 1$. [3 marks]

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ow 14. Refer to the diagram for Question 14. A ride at a theme park has a car attached to each end of a rotating arm.

The starting position of car A is shown in the diagram.

As the arm rotates clockwise, the height, h metres, of car A above the ground in each rotation is given by

$h = 10 - 8\cos x°,\ 0 \leq x < 360$

where x° is the angle the arm has turned from car A's starting position.

Calculate the two values of x for which the height of car A is 13 metres above the ground. [4 marks]

ow 15. Refer to the diagram for Question 15.

In the diagram, $\overrightarrow{DG}$ and $\overrightarrow{GE}$ are represented by the vectors $\mathbf{r}$ and $\mathbf{s}$ respectively, and $\overrightarrow{DE} = 3\overrightarrow{EF}$.

Express $\overrightarrow{GF}$ in terms of $\mathbf{r}$ and $\mathbf{s}$.

Give your answer in its simplest form. [2 marks]

[END OF QUESTION PAPER]