

N5

National Qualifications 2022

Mathematics

Paper 1 (Non-calculator)

Wednesday, 4 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 - 40

Attempt ALL Questions

You must NOT 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 owl in the margin indicates a new question.

A separate formula sheet is provided.

[Braille page 2] Total marks – 40

Attempt ALL questions

ow 1. Evaluate

$$(2/3)(1/5 + 3/4).$$

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

ow 2. Given that $f(x) = x^3 - 2$, evaluate $f(-3)$. [2 marks]

ow *3. Refer to the diagram for Question 3. The diagram shows a cone with diameter 20 centimetres and height 60 centimetres.

Calculate the volume of the cone. [2 marks]

Take $\pi = 3.14$.

ow *4. Refer to the diagram for Question 4. The diagram shows a circle with centre O.

AB is a tangent to the circle at the point C.

CD is a diameter of the circle.

Angle EOD is 68° .

Calculate the size of angle ACE. [3 marks]

ow 5. (a) Express $x^2 + 8x + 15$ in the form $(x + a)^2 + b$. [2 marks]

ow 5. (b) Hence, or otherwise, state the coordinates of the turning point of the graph of

[Braille page 3] $f(x) = x^2 + 8x + 15$. [1 mark]

ow 6. Find the equation of the line passing through the points $(-3, -1)$ and $(-5, 7)$.

Give the equation in its simplest form. [3 marks]

ow 7. Change the subject of the formula $D = (B+4)/C^2$ to B. [2 marks]

ow 8. Refer to the diagram for Question 8. Part of the graph of $y = a \sin bx^\circ$ is shown in the diagram.

ow 8. (a) State the value of a . [1 mark]

ow 8. (b) State the value of b . [1 mark]

ow 9. Refer to the diagram for Question 9. The diagram shows triangle ABC.

- AB = 7 centimetres
- BC = 3 centimetres
- AC = 5 centimetres

Calculate the value of $\cos B$.

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

ow 10. Tommy buys flower seeds from a website.

Tommy is given a 30% discount. He pays £16.10 for the seeds. Calculate the cost of the flower seeds without the discount. [3 marks]

ow 11. Simplify $(m^{-2})^4 \times m^{-5}$.

Give your answer with a positive power. [3 marks]

ow 12. Express

$$(4/(x+2)) \div (5/((x+2)^2)), \quad x \neq -2$$

as a single fraction in its simplest form. [2 marks]

ow 13. Expand and simplify

$$\sqrt{10}(\sqrt{10} - \sqrt{2}) + 8\sqrt{5}. \quad [3 \text{ marks}]$$

ow*14. Describe the graph of $y = (x+1)(x-3)$

Write the points of intersection with the x -axis and the y -axis, and the coordinates of the turning point. [3 marks]

ow *15. Refer to the diagram for Question 15. A triangle and rectangle are shown in the diagram.

ow 15. (a) Find an expression for the area of the triangle. [1 mark]

ow 15. (b) Given that the area of the triangle is equal to the area of the rectangle, find algebraically the value of x . [4 marks]