

[Braille page 1] X844/75/02 PRINT COPY BRAILLE

N5

National Qualifications

2026

Applications of Mathematics

Paper 2

Friday, 15 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 – 55

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.

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

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

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 — 55

Attempt ALL questions

Now 1. A new housing development is being built in a village.

The village currently has a population of 750.

The developers expect the population to increase by 36% for each of the next 3 years.

Calculate the expected population after 3 years.

Give your answer rounded to 2 significant figures. [4 marks]

Now 2. Refer to the diagram for Question 2. Rachel's front door is in the shape of a rectangle with a semi-circular window.

The dimensions are shown.

Rachel wants to paint the front of the door excluding the window.

Calculate the area of the door to be painted. [2 marks]

Now 3. Lee earns a gross annual salary of £42,000.

National Insurance is calculated on a person's pay before deductions such as pension contributions.

[Braille page 3]

National Insurance rates per year

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Up to £12,584	0%
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From £12,584 to £50,284	8%
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Over £50,284	2%
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(a) Calculate Lee's annual National Insurance payment. [2 marks]

Lee pays 11.2% of their gross annual salary into their pension.

Lee's annual income tax is £4787.12.

(b) Calculate Lee's annual net pay. [2 marks]

ow 4. Shehbaz is travelling from Glasgow to Barcelona and then Istanbul.

Rates of Exchange

Pounds Sterling

Other

(£)

Currencies

.....

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1

1.15 euros

1

44 Turkish lira

- Shehbaz converted £840 into euros.
- He stayed in Barcelona for 4 **[Braille page 4]** days.
- He spent 205 euros each day that he was in Barcelona.

He converted his remaining euros into Turkish lira.

(a) Calculate how many Turkish lira he received. [3 marks]

Shehbaz flies from Glasgow to Barcelona.

The plane departs at 1:30 pm local time.

The time in Barcelona is 1 hour ahead of Glasgow.

The plane flew 1680 kilometres at an average speed of 600 kilometres per hour.

(b) Calculate the local time the plane landed in Barcelona. [3 marks]

Shehbaz flies from Glasgow to Barcelona and then from Barcelona to Istanbul.

From Glasgow to Barcelona is a distance of 1680 km.

From Barcelona to Istanbul is a distance of 2250 km.

A scale drawing was constructed using a scale of 1 cm : 300 km.

(c) Determine the length of the line on the scale drawing from Glasgow to Barcelona. [1 mark]

[Braille page 5] (d) Refer to the diagram for Question 4 (please note that the scale differs from that used in 4 (c)).

Determine the bearing of:

(i) Barcelona from Glasgow [1 mark]

(ii) Istanbul from Barcelona [1 mark]

(iii) Glasgow from Istanbul. [1 mark]

On the supplied scale drawing the distance from Istanbul to Glasgow is measured as 20.4 cm.

(iv) Determine the actual distance from Istanbul to Glasgow. [1 mark]

Now 5. Alan works for a company that lays patios.

His current hourly rate is £14 per hour.

He has a contract for 35 hours of work per week but regularly works extra hours.

Alan has been offered two pay options:

- Option 1: Earn time and a half for any extra hours.
- Option 2: Receive a 10% increase in his hourly rate. All hours worked will be paid at this rate.

(a) Determine which option gives Alan a higher gross pay for working 40 **[Braille page 6]** hours in a week. [3 marks]

Alan needs to buy 120 paving slabs for a patio. He is comparing prices from three different shops, each with its own pricing.

- Shop A: The cost per slab is £10, and there is a 'Buy 2, Get 1 Free' deal.
- Shop B: The cost per slab is £9, with a 15% discount applied to the total cost of the slabs.

- Shop C: The cost per slab is £7.50.

(b) Determine the cheapest option for buying 120 slabs. [3 marks]

It takes 4 workers 15 hours to lay a patio.

The patio company are able to provide 2 extra workers.

All workers work at the same rate.

(c) Calculate how long it will take to lay the patio. [2 marks]

The patio company completed a job for a customer.

- It cost the company £2300 for materials and £672 for wages to complete the job.

- The customer paid £3800 for the job.

(d) Calculate the company's percentage profit. [2 marks]

[Braille page 7] ow 6. Katy is conducting quality control for a garden centre.

Bags of fertiliser must weigh $25 \text{ kg} \pm 4.8\%$.

Below are the weights of ten bags of fertiliser, in kilograms:

24.7 25.8 29.9 24.6 23.7

26.5 26.0 24.4 20.1 25.9

(a) Identify which of these weights are not suitable. [3 marks]

The garden centre recorded how many products it sells.

A sample of the number of spades sold per month is shown.

35 18 28 30 32 40 20

(b) Calculate the mean and standard deviation of the number of spades sold per month. [4 marks]

The garden centre also sells hose pipes.

In the same months the mean number of hose pipes sold each month was 18 and the standard deviation was 13.

(c) Make two valid comments comparing the number of spades sold and the number of hose pipes sold. [2 marks]

Margaret buys a greenhouse from the garden centre.

The advertised price was £900.

[Braille page 8] Margaret used a payment plan to purchase the greenhouse.

The total price of the payment plan was 18% more than the advertised price.

The payments are calculated as follows:

- the deposit is $\frac{1}{5}$ of the total price.
- there are 10 equal monthly instalments.
- followed by a final payment of £160.

(d) Calculate the cost of each monthly instalment. [3 marks]

ow * 7. A golf club has adult, senior and junior members.

The ratio of members is 4:3:1 respectively.

There are 102 senior members.

(a) Calculate the total number of members in the club. [2 marks]

Refer to the diagram for Question 7 (b). The club holds an annual Ladies' Championship. The winner receives a trophy.

The trophy has a metal top, consisting of a cone and sphere.

The cone and sphere both have a radius of 3.5 cm.

The total height of the metal top is **[Braille page 9]** 11 cm.

(b) Calculate the volume of metal in the trophy top. [3 marks]

The length of a golf hole is the distance between the tee and the flag.

Laura plays a golf hole that is 430 metres long.

Laura stands at the tee and hits her ball. Her ball stops 274 metres from the tee, as shown in the 2 diagrams for Question 7(c).

The distance between Laura's ball and the flag is shown by the dashed line in Diagram 2.

(c) Calculate the distance between Laura's ball and the flag. [4 marks]

The club shop sells boxes of golf balls with dimensions as shown.

The box has the dimensions:

length 17.2 cm;

width 12.9 cm;

height 4.3 cm.

The box has a 'This Way Up' statement that means the box must stand on its largest side. See diagram 7d A.

The boxes are shipped in a container with internal dimensions as shown.

The boxes must be aligned in the same direction.

[Braille page 10] The container has the dimensions:

length 65 cm;

width 52 cm;

height 40 cm.

The container has a 'This Way Up' statement that means the container must stand on its largest side. See diagram 7d B.

(d) Calculate the maximum number of golf ball boxes than can fit in the container.
[3 marks]

[END OF QUESTION PAPER]