N5.

National Qualifications

2022.

Applications of Mathematics.

Paper 1 (Non-calculator)

Friday, 6 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 – 35.

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.

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.

Tactile diagrams are produced in a separately bound booklet.

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]. A separate formula sheet is provided.

[Braille page 3]. Total marks — 35.

Attempt ALL questions.

ow 1. Refer to the diagram for Question 1. Steven blew up the tyres on his bike. In order to be safe, his tyres should be blown up to a pressure of between 35 and 45 p.s.i. .

 Steven blew his tyres up to a pressure of 230 kPa. Determine whether his tyres are at a safe pressure. Justify your answer. [2 marks].

ow * 2. Marie and John are both reading the same book.
Marie is using an e-book reader and John is reading a hardback book.
Marie has read 62% of her book, John has read 210 pages out of 350 pages of his book. John thinks he has read more of the book than Marie. Is he correct?
Use your working to justify your answer. [2 marks].

ow * 3. The temperature, in degrees Celsius, of a restaurant fridge is recorded each day. The temperatures over a 13 day period were:

    3.2;   4.2;   3.3;   3.6;   3.7;   3.2;   4.2;
    3.3;   3.4;   3.6;   3.2;   4.1;   2.9.

[Braille page 4]. ow * 3 (a). For this data, calculate:

(i) the highest temperature

(ii) the lowest temperature

(iii) the median

(iv) the lower quartile

(v) the upper quartile. [4 marks].

ow 3 (b). Calculate the interquartile range for this set of data. [1 mark].

ow 3 (c). The temperatures of a café fridge were also recorded for the same 13 day period. The interquartile range of these temperatures was 0.9 degrees Celsius.

Make one valid comment comparing the temperatures of these two fridges. [1 mark].

ow * 4. Kieran and Dylan decide to redesign their garden.
There are several tasks that need to be done in order to achieve this.

[Braille page 5]. In the table below, Activity is followed by: Description; Preceding task; Time taken.

A: lay patio; I; 5 hours.

B: assemble furniture; A; 1 hour 30 minutes.

C: remove decking; none; 6 hours.

D: paint fence; G; 3 hours.

E: lay artificial grass; I; 3 hours.

F: remove grass; none; 2 hours.

G: buy all materials; C, F; 45 minutes.

H: plant patio tubs; A; 2 hours 15 minutes.

I: roughcast wall; D; 1 hour 45 minutes.

Refer to the diagram for Question 4 (a). .

ow * 4 (a). Complete the diagram to show the tasks and times in the
boxes by writing the letters and times corresponding to spaces (i) to (ix).
[2 marks]..

Boxes (vii) and (viii) have been completed for you.

(i) _.
(ii) _.
(iii) _.
[Braille page 6]. (iv) _.
(v) _.
(vi) _.
(vii)   E 3 hours.
(viii)   H 2 hours 15 mins.
(ix) _.

ow 4 (b). Based on the times given and using the diagram for question 4 (a),
calculate the minimum time to complete all of the work.

Give your answer in hours and minutes. [2 marks].

ow * 5. Refer to the diagram for Question 5. Jade runs a game stall at the Christmas coffee morning.

Her game requires two spinners to be spun and allowed to come to rest.

The spinners are fair and are labelled Spinner A and Spinner B.

Each spinner has a number of edges and each edge has a single number displayed.

Spinner A has 5 edges with the following numbers displayed; 2, 3, 4, 5, 6.

Spinner B has 7 edges with the following numbers displayed; 0, 2, 4, 6, 8, 10, 12.

Each spinner will come to rest on an edge with a number.

The numbers on which the spinners come to rest are multiplied together.

[Braille page 7].. To win a prize the answer to this multiplication must be greater than 30.
Calculate the probability of winning a prize. [3 marks].

ow 6. Farah works in a shop.

She earns £8.40 per hour.

She gets paid overtime at time-and-a-half.

In January she worked 100 hours basic plus 30 hours overtime.

In January she paid £33.50 in income tax, £61.92 in National Insurance and

£25.20 towards her pension.

Calculate Farah's net pay for January. [2 marks].

ow 7. Tracy decides to walk to the top of Dumyat Hill from Blairlogie car park.

The horizontal distance between these two places is 3 kilometres.

Blairlogie car park is 21 metres above sea level.

The top of Dumyat Hill is 420 metres above sea level.

Calculate the average gradient between the Blairlogie car park and the top of Dumyat Hill.

[Braille page 8]. ow 8. Bryan, Jamie and Jessica bought two medium pizzas between them.

Bryan ate 5/7 of a pizza,

Jamie ate 2/3 of a pizza,

Jessica ate the rest.

Calculate the total amount of pizza that Jessica ate. Give your answer as a fraction of a pizza. [3 marks]

ow * 9. Refer to the diagram for Question 9.

Zainab designs a new badge.

The design is based on a rectangle and a semi-circle as shown in the diagram.

She decides to put gold edging around the badge.
Calculate the length of gold edging she needs.
Take π = 3.14. [2 marks].

ow 10. A youth group is planning a fundraising night to help pay for a trip.

The expenses for the night are shown.

DJ and disco £340.
Hall hire £50.
Hog roast £770.
Ticket production £40.

[Braille page 9]. They will sell 200 tickets..

They need to make a profit of £2000.

Calculate the minimum ticket price to achieve this profit. [2 marks].

ow 11. Refer to the diagram for Question 11.

A flag is in the shape of an Isosceles triangle with a rectangle on the

top.

Calculate the area of the flag. [4 marks].

ow 12. A company delivers parcels to people's homes.

The probability of a parcel arriving damaged is 0.023.

In one month, the company delivered 700 parcels, of which 15

were damaged. Determine if this is more or less than expected. [2 marks].

[END OF QUESTION PAPER]