FOR OFFICIAL USE

N5

National Qualifications 2025

Mark

X844/75/01

Applications of Mathematics Paper 1 (Non-calculator)

FRIDAY, 16 MAY

9:00 AM – 9:50 AM

X8447501

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day Month Year

Scottish candidate number

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.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

SQA ©

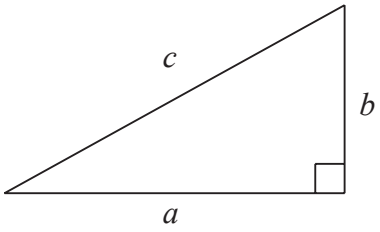
X844750101

FORMULAE LIST

Circumference of a circle $C = \pi d$

Area of a circle $A = \pi r^2$

Theorem of Pythagoras



$a^2 + b^2 = c^2$

Volume of a cylinder $V = \pi r^2 h$

Volume of a prism $V = Ah$

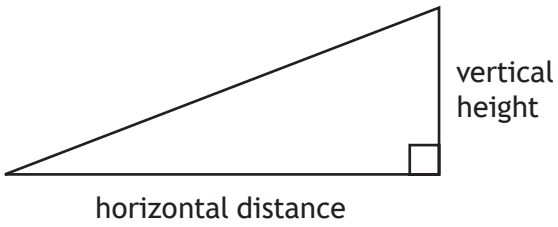
Volume of a cone $V = \frac{1}{3}\pi r^2 h$

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

Standard deviation $s = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n - 1}}$

or $s = \sqrt{\frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}{n - 1}}$, where n is the sample size.

Gradient



$$\text{gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

Total marks — 35

Attempt ALL questions

1. At a school, pupils voted to elect a head prefect.

- Fraser received $\frac{3}{8}$ of the votes.
- Gracie received $\frac{1}{5}$ of the votes.
- Alison received the rest of the votes.

Calculate the fraction of the votes that Alison received. **3**

[Turn over

2. Laura is buying a picture.

She looks on 3 websites to find the best deal.

Website A	**Website B**	**Website C**
Picture £21.50	Picture £35	Picture £30
	Offer: 30% off all pictures	Offer: $\frac{1}{4}$ off all pictures
Postage £3.49	Postage Free	Postage £2.80

Determine the website which offers the best deal to buy the picture and get it posted to Laura.

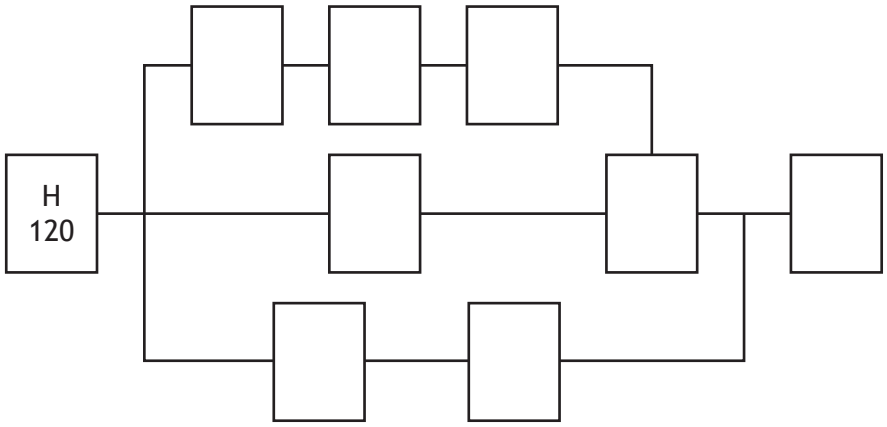
Use your working to justify your answer. **3**

3. A company produced the following table to show all the tasks involved in manufacturing and packaging chocolate eggs.

Activity	Description	Preceding activity	Time (seconds)
A	Melt chocolate and stir ingredients	H	600
B	Wrap the egg	C, I	30
C	Cool the chocolate	D	1800
D	Pour chocolate into egg mould	A	105
E	Construct the cardboard box	G	60
F	Place wrapped egg into box	B, E	45
G	Print cardboard	H	240
H	Collect materials and ingredients	none	120
I	Print foil	H	180

(a) Complete the diagram below to show the tasks and times. **2**

(An additional diagram, if required, can be found on *page 13*.)



(b) Calculate the minimum time taken to manufacture and package a chocolate egg. **1**

4. Harris recorded the time, in minutes, that it took him to drive to work over eight days.

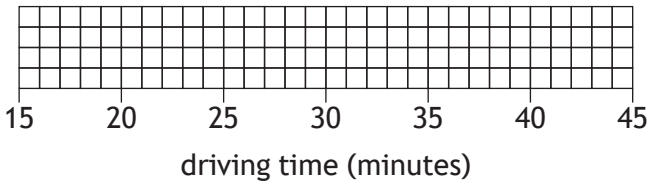
22 21 37 25 32 28 36 24

(a) For this data, calculate:

- the median
- the lower quartile
- the upper quartile. **2**

(b) Construct a box plot for this set of data.

(An additional diagram, if required, can be found on *page 13*.) **2**



(c) Calculate the interquartile range for the number of minutes it took Harris to drive to work. **1**

His colleague Lewis also recorded the number of minutes it took him to drive to work over eight days.

The interquartile range for the number of minutes that Lewis took is 9 minutes.

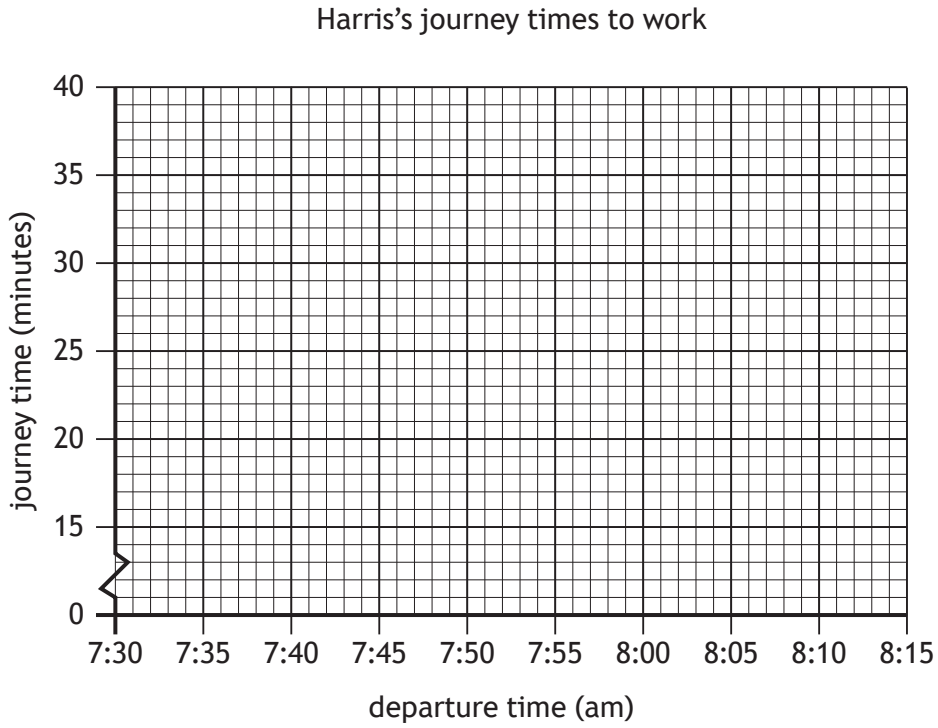
(d) Make one valid comment comparing the number of minutes Harris and Lewis took to drive to work. **1**

4. (continued)

Harris noticed that his journey times were affected by the time he departed.
The table shows his journey time in minutes.

Departure time (am)	7:32	7:36	8:10	7:40	8:02	7:50	8:04	7:45
Journey time (minutes)	22	21	37	25	32	28	36	24

(e) On the grid below draw a scattergraph to show this data. **2**
(An additional diagram, if required, can be found on *page 14*.)



(f) Draw a line of best fit on your scattergraph. **1**

(g) Tomorrow, Harris plans to depart at 7:55 am. Use your line of best fit to estimate his journey time. **1**

5. Julie scored 78% in her science test.

She also scored 32 out of 40 in her maths test.

Determine which subject she performed better in.

Justify your answer. **2**

6. Ramani works as a sales person for a car company.

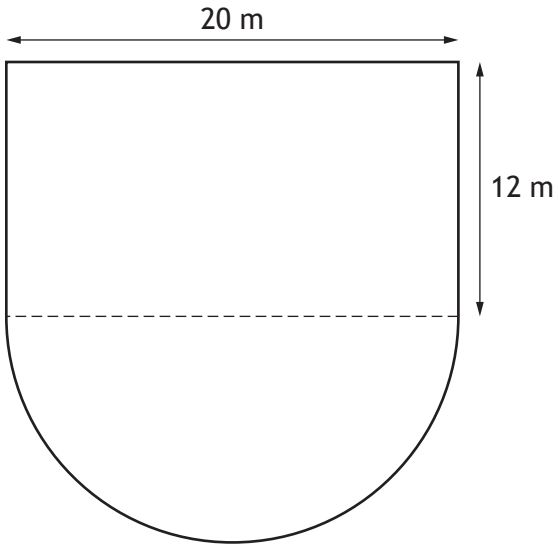
She is paid a basic monthly salary of £1870 plus commission of 3% on her monthly sales **over** £58,000.

In April, her sales totalled £96,000.

Calculate Ramani's gross pay in April. **2**

7. A school is designing a playpark.

It is in the shape of a rectangle and a semi-circle.



(a) Calculate the area of the playpark.

Take $\pi = 3.14$ **2**

The school plans to cover some of the playpark with bark.

- They plan to cover 81 m^2 with bark.
- 1 bag of bark covers 5 m^2.
- 1 bag of bark costs £8.

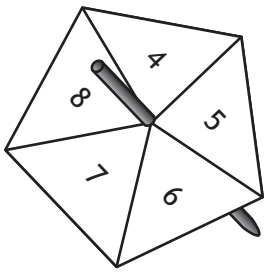
(b) Calculate the cost of the bark. **2**

8. Lesley ran a game stall at her local gala.

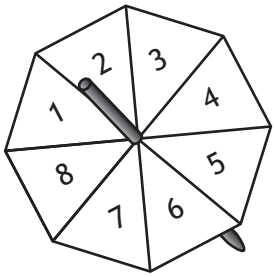
The game requires two spinners to be spun and allowed to come to rest.

The spinners are fair and are shown below.

To win a prize, spinner B must land on **a larger number** than spinner A.



spinner A



spinner B

(a) Calculate the probability of winning a prize. **3**

8. (continued)

Catriona runs a **different** game at the gala.

Players who win receive a £5 prize.

When playing this game, the probability of a player winning a prize is 0.15.

The game was played 80 times.

Catriona gave out a total of £70 in prizes.

(b) Determine if this is more or less than expected. **3**

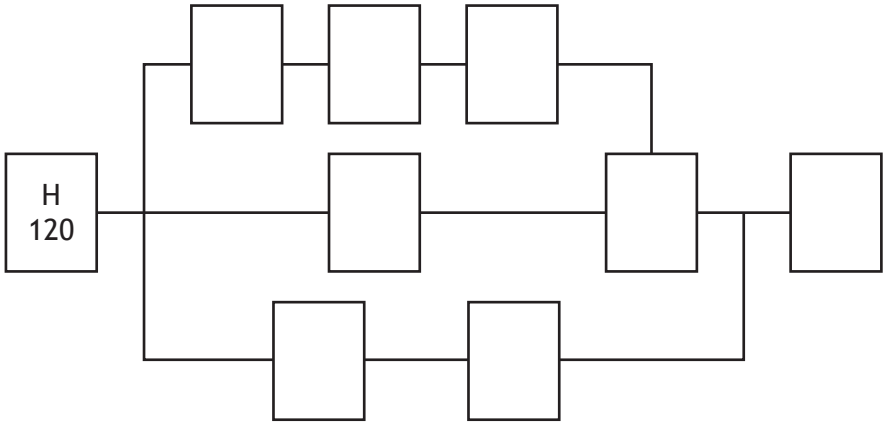
[Turn over

9. A farm has 3 different types of animal.
It has sheep, pigs and cows in the ratio 9:7:4 respectively.
There are 180 **more** sheep than there are cows.
Calculate the total number of animals on the farm. **2**

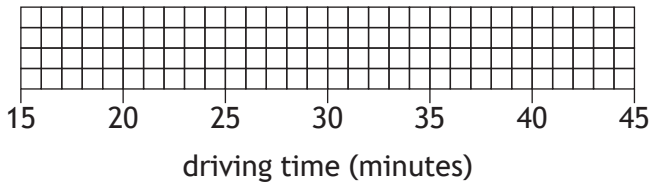
[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

Additional diagram for use with question 3 (a)

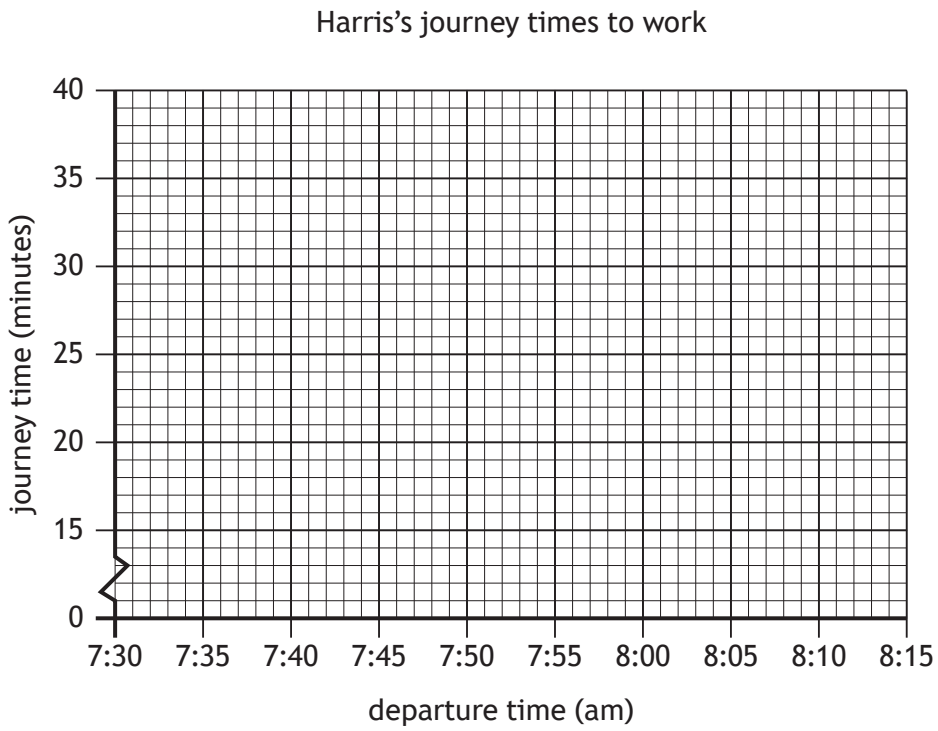


Additional diagram for use with question 4 (b)



ADDITIONAL SPACE FOR ANSWERS

Additional diagram for use with question 4 (e)



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ADDITIONAL SPACE FOR ANSWERS

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