FOR OFFICIAL USE

N5 National Qualifications

Mark

X844/75/01

Applications of Mathematics Paper 1 (Non-calculator)

Duration — 1 hour 5 minutes

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 — 45

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 ©

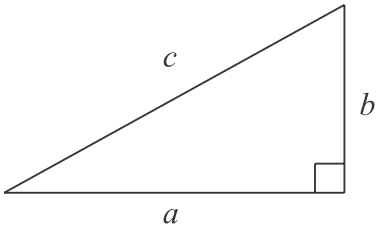
X8447501

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 $V = Ah$

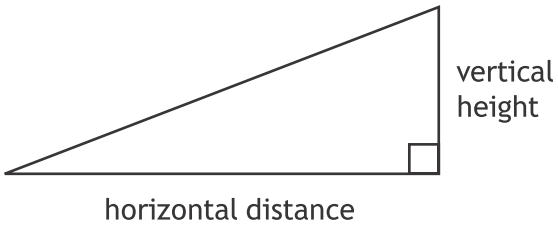
Volume of a cone $V = \frac{1}{3}\pi r^2 h$

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 — 45

Attempt ALL questions

1. Ben worked on a Saudi Arabian oil rig for 4 months.
He was paid in Saudi Arabian Riyal.

Month	Earnings (Riyal)
January	32 616
February	30 120
March	38 624
April	35 440

The exchange rate was 5 Riyal to the pound.
Calculate his mean monthly earnings over the 4 months. **2**
Give your answer **in pounds**.

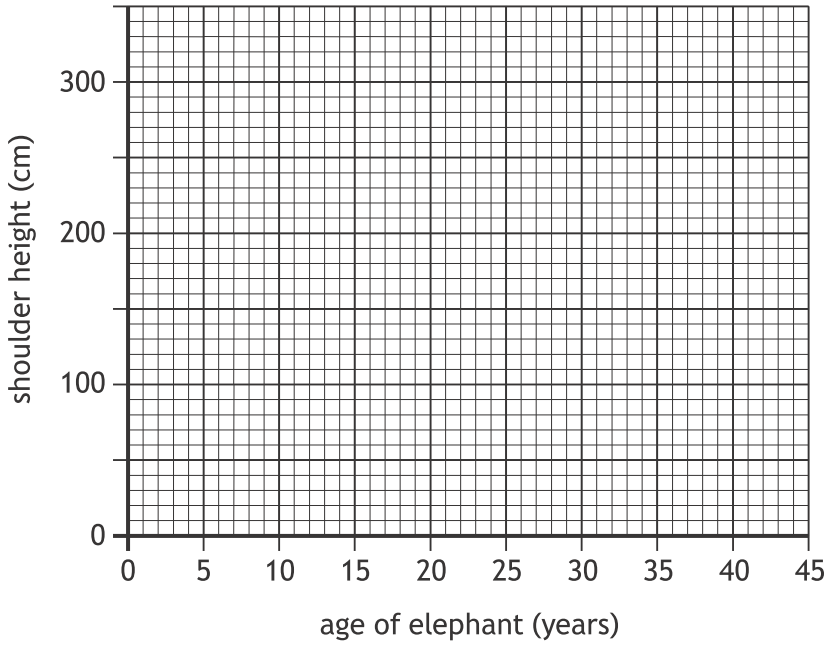
2. African elephants continue to grow for the duration of their lives.

The table below shows the age of a sample of African elephants and their shoulder heights.

Age of elephant (years)	12	17	28	35	43
Shoulder height (cm)	230	250	270	275	300

(a) On the grid below draw a scattergraph to show this data. **2**

(An additional grid, if required, can be found on *page 18*)



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

(c) Use your line of best fit to estimate the age of an African elephant that is 260 cm tall. **1**

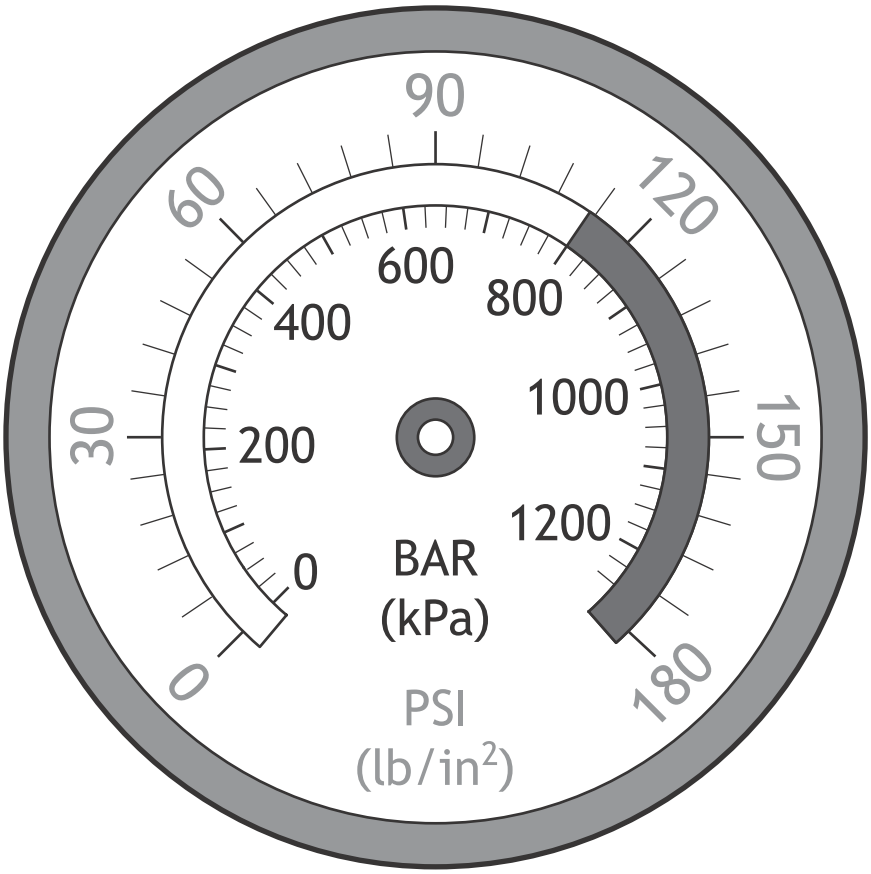
3. A polling company predicted the result of an election.

They claimed that the prediction would be within $\pm 3\%$ of the result.

Prediction	Result
3400 votes	3300 votes

Determine if the company's claim was correct. **2**

4. Laura has to inflate her lorry tyres to a pressure of 84 PSI.
Mark this pressure on the gauge shown. **2**



5. Lucy works as a lifeguard.

Lucy's overtime rate is **time and a half**.

During one week Lucy worked 40 hours at normal rate and 10 hours at overtime rate.

Lucy was paid £550 for that week.

(a) Calculate Lucy's normal hourly rate of pay. **2**

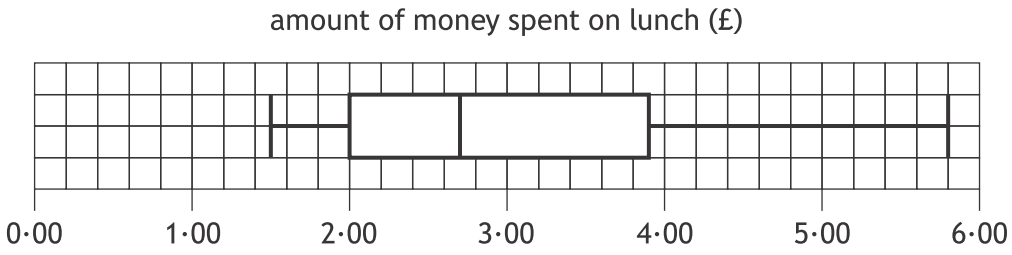
Allan is also a lifeguard.

His normal hours are 40 hours per week.

Over the course of 5 weeks Allan worked an additional 16 hours overtime.

(b) Express Allan's overtime hours as a percentage of his normal hours. **2**

6. Mr Kenneth asked his class how much money they had spent on their lunch.
The results are shown in the boxplot.



(a) Calculate the inter-quartile range. **2**

The money spent on lunch by Mrs Campbell's class had an inter-quartile range of £1·82.

(b) Make one valid comment comparing the money spent on lunch by Mr Kenneth's class and Mrs Campbell's class. **1**

7. Convert $\frac{3}{7}$ to a decimal fraction. 2

Round your answer to **3 decimal places**.

[Turn over

8. The bar chart below shows the medals won by four countries in the 2016 Olympic Games.

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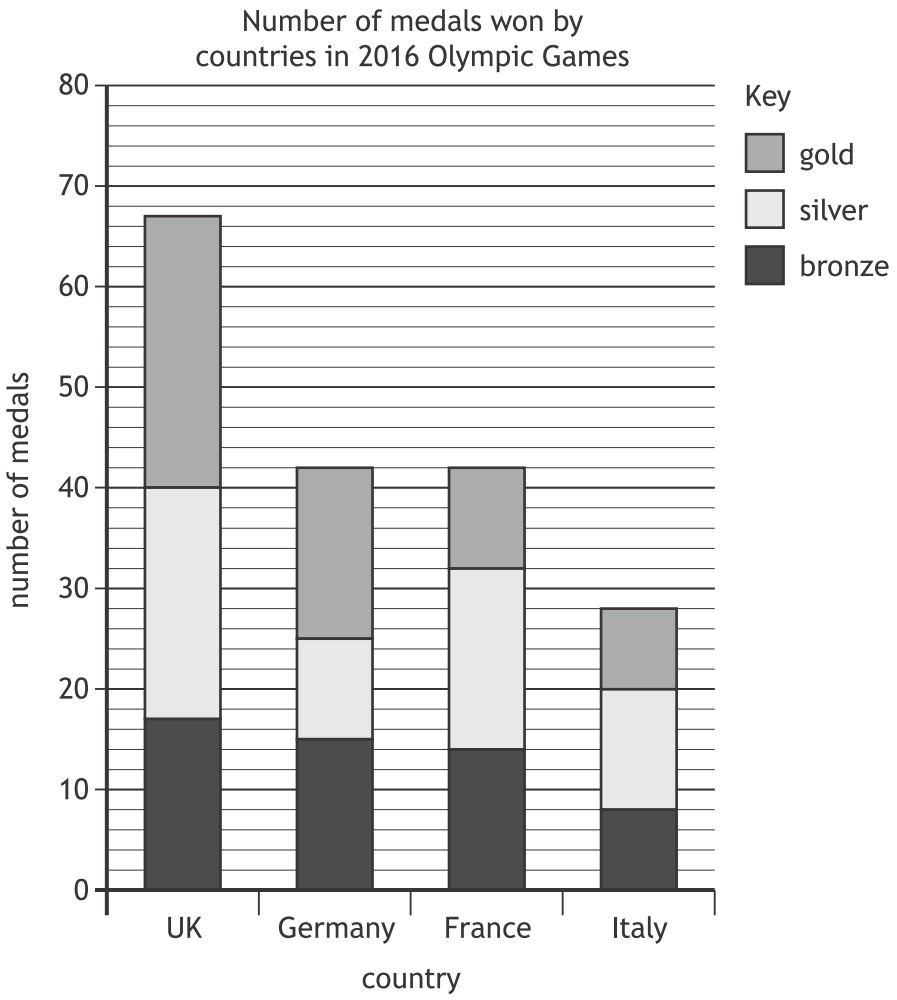


(a) Calculate the number of gold medals won by the UK in the 2016 Olympic Games. **1**

(b) Calculate the ratio of **gold : silver : bronze** medals for France. **2**

Give your answer in its simplest form.

9. Gillian flew from Aberdeen to Caracas via Paris.

She got on the aircraft in Aberdeen at 06:05 local time.
She was off the aircraft in Paris for 1 hour 15 minutes.
She got off the aircraft at Caracas at 15:30 local time.

Paris is 1 hour ahead of Aberdeen.
Caracas is 5 hours behind Paris.

Calculate the total time she was **on the aircraft**. **3**

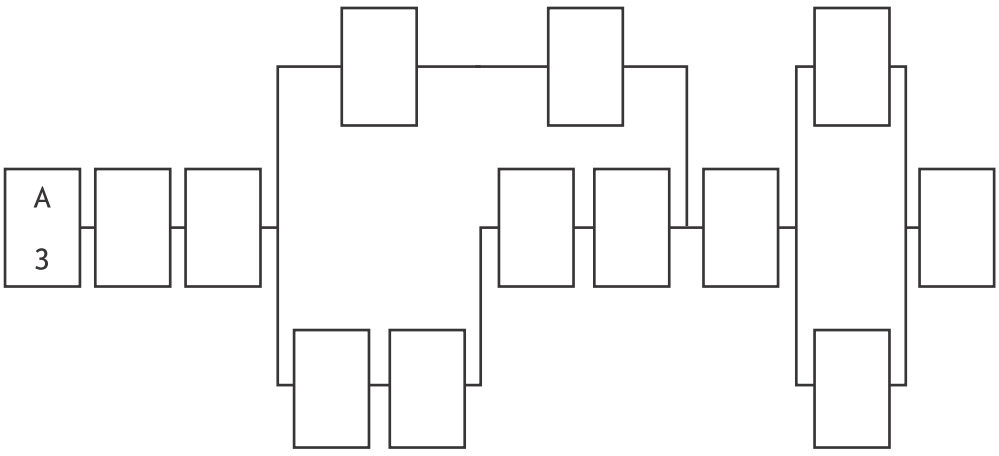
10. Sarah wants to make chilli con carne.

The table shows the list of tasks and the time taken for Sarah to complete them.

Activity	Description	Preceding task	Time (minutes)
A	assemble ingredients	none	3
B	chop onions	A	5
C	heat pan with oil	B	2
D	fry onions in pan	C	6
E	add mince to pan and stir	D	5
F	open cans of kidney beans and tomatoes	C	2
G	drain kidney beans	F	1
H	measure water into jug	G	1
I	add spice mix to water	H	2
J	add spice mix and water to pan	E,I	2
K	add kidney beans and tomatoes and simmer	J	35
L	microwave rice	J	3
M	serve	K,L	2

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

(An additional diagram, if required, can be found on *page 18*)



10. (continued)

(b) Sarah claims she can make this chilli con carne in 55 minutes.
Based on the times given, determine if she is correct. **2**

11. George is planning to have his fence repainted.

Last year 3 painters painted the fence in 8 hours.
There will be 5 painters painting the fence this year.
All these painters work at the same rate.

They start painting at 09:30.
They will have a 40 minute break.

Calculate the time they will finish painting the fence. **4**

12. The votes in a school for a class representative were split as follows

- $\frac{2}{5}$ for Sam
- $\frac{4}{9}$ for Ashley
- the remaining votes were for Lesley.

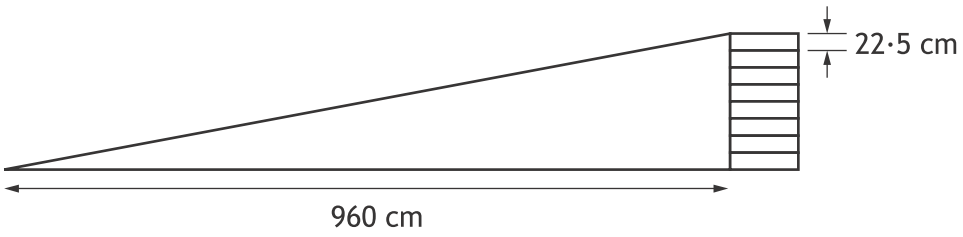
Calculate the fraction of votes that were for Lesley. **3**

13. John has a slope in his back garden.

The slope is the height of 8 planks.

Each plank is 22·5 cm in height.

The planks are 960 cm away from the bottom of the slope.



(a) Calculate the gradient of the slope. **2**

His neighbour Helen also has a slope.

The gradient of her slope is 20%.

Helen thinks her slope is steeper than John's slope.

(b) Determine if she is correct. **2**

14. A 240 g steak costs £3·84.

Complete the shelf label to show the price per kilogram. **2**

240 g steak £3·84	equivalent to	1 kilogram _____

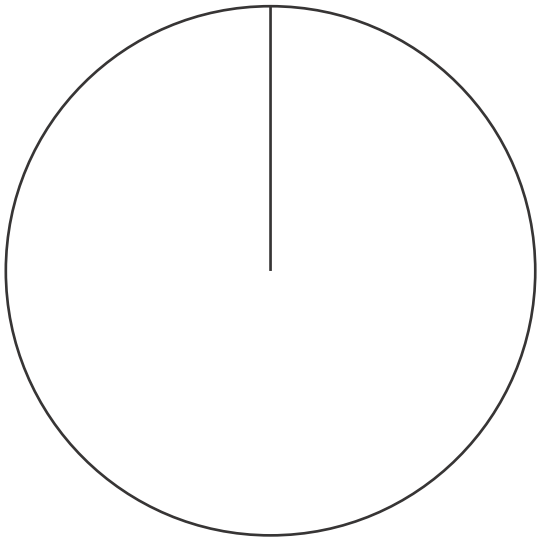
15. Stuart's monthly budget is

- £660 for rent and bills
- £450 for food and socialising
- £90 for savings.

Construct a pie chart to show this information. **3**

(An additional diagram, if required, can be found on *page 19*)

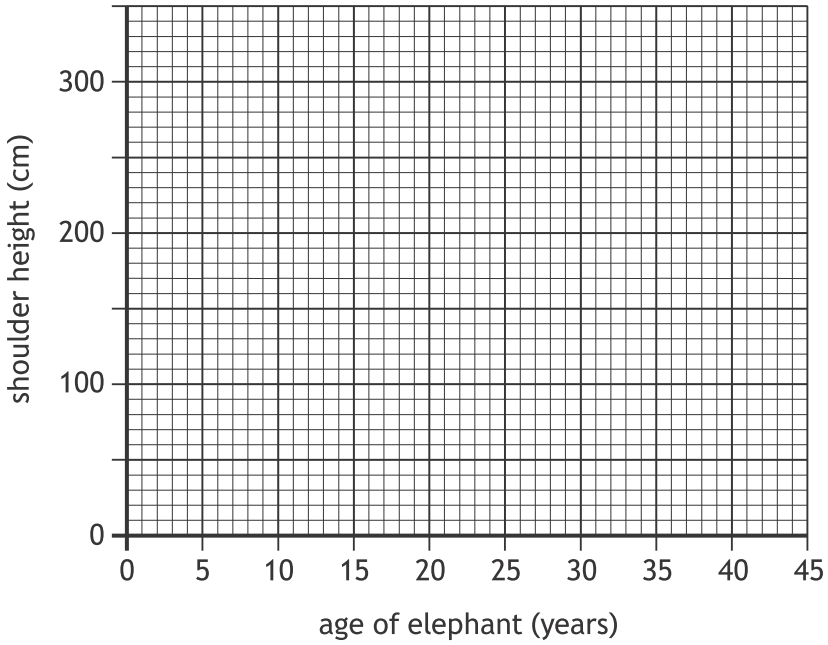
Stuart's monthly budget



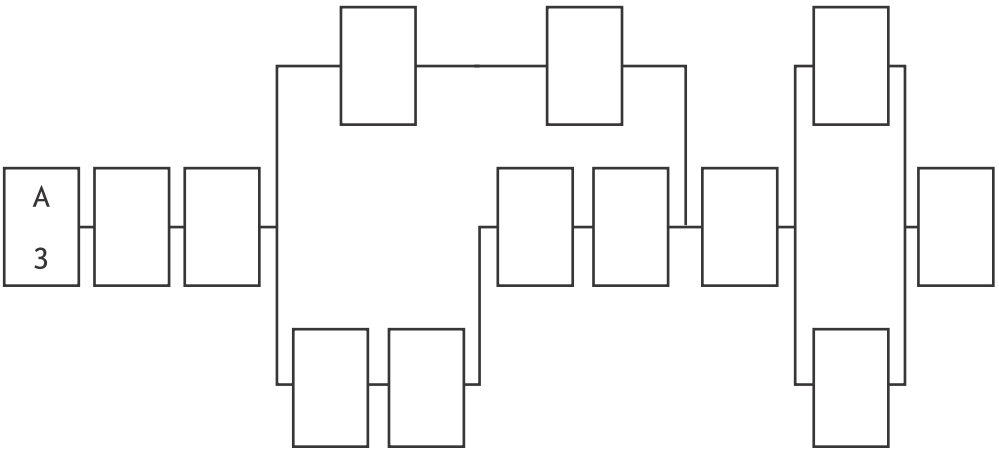
[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

Additional grid for question 2 (a)



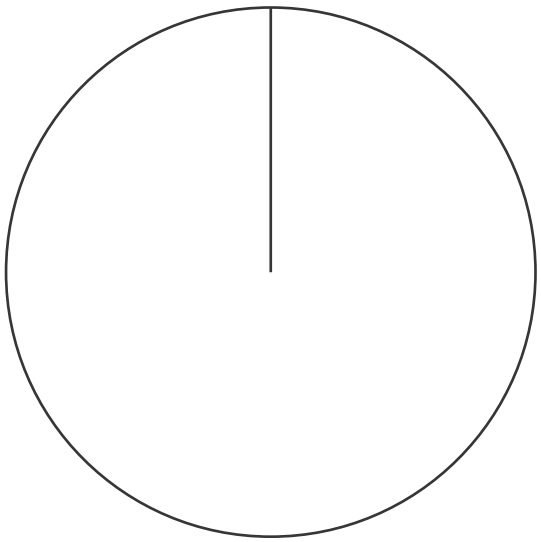
Additional diagram for question 10 (a)



ADDITIONAL SPACE FOR ANSWERS

Additional diagram for question 15

Stuart's monthly budget



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ADDITIONAL SPACE FOR ANSWERS