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Practice Paper C
Paper 2

Name: _____

Class: _____
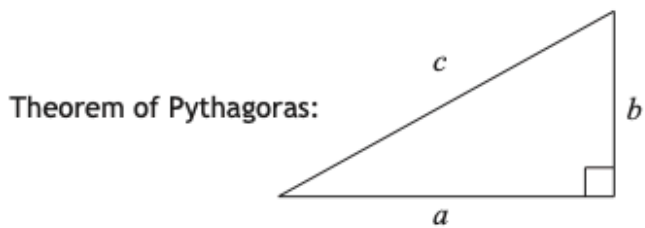
Teacher: _____

Date: _____

You may **NOT** use a calculator.

Full credit will be given only where the solution contains appropriate working.

FORMULAE LIST

Circumference of a circle: $C = \pi d$

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

Theorem of Pythagoras:
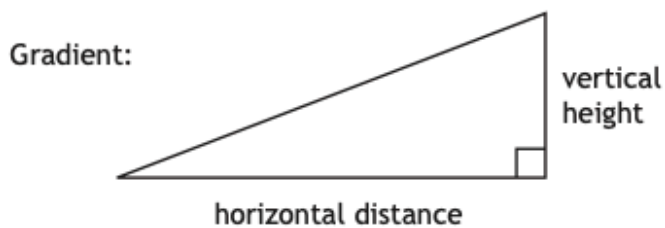

$a^2 + b^2 = c^2$

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: $s = \sqrt{\dfrac{\Sigma(x-\bar{x})^2}{n-1}} = \sqrt{\dfrac{\Sigma x^2 - (\Sigma x)^2/n}{n-1}}$, where n is the sample size.

Gradient:

horizontal distance

vertical height

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

All questions should be attempted

Marks

1. The population of Northern Ireland is recorded to the nearest thousand.

   In 2018 the population was 1 780 000
   In 2019 the population was 1 816 000

   a) Find the percentage increase on the population between 2018 and 2019 **to 2 decimal places.**

   2

   The population is expected to increase by 1.25% every year for the next 5 years.

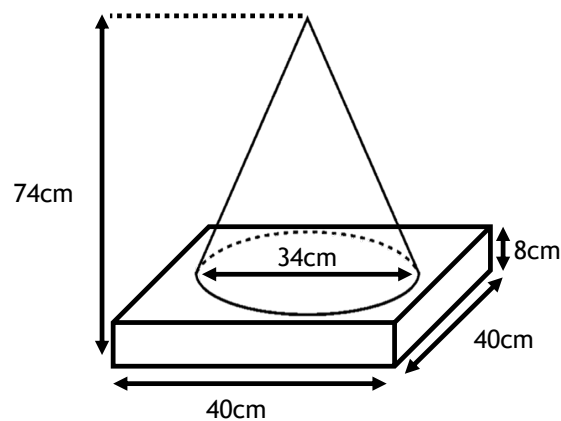   b) Calculate the expected population of Northern Ireland in 2024 to the **nearest thousand.**

   4

2. The size of a **rectangular** billboard is measured to be 15.1m by 6.25m.

The instrument used to measure it has a degree of error or ±0.05m.

Find the **maximum** possible area of the billboard.
Give your answer to the nearest metre. **4**

3. The dimensions of an ornament are shown below.
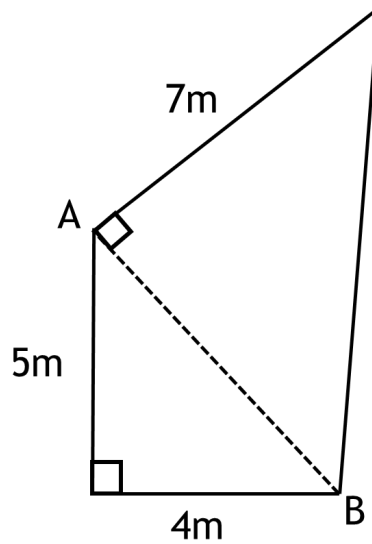The ornament is made up of a glass cone and a wooden cuboid together.

74cm

34cm

8cm

40cm

40cm

Find the volume of the ornament to 3 significant figures **4**

4. A new sail is being designed for a yacht as shown below.
It consists of two right angled triangles.
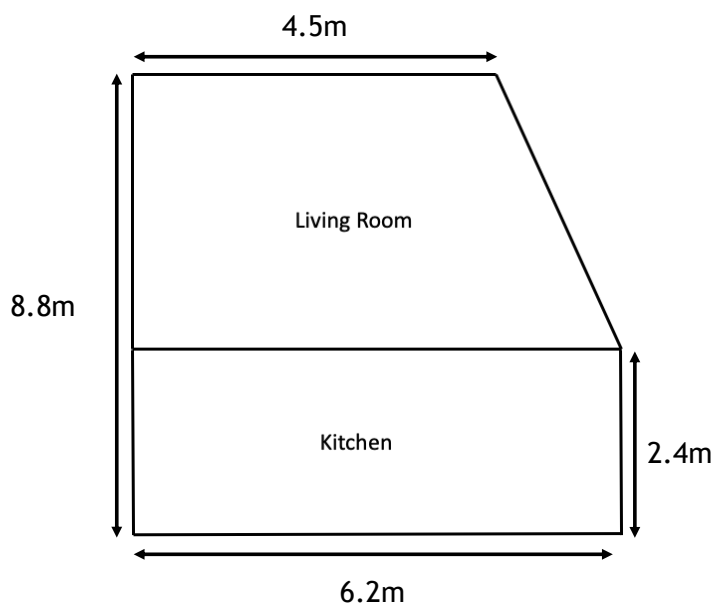

a) Find the length of AB   **2**

b) Find the area of the sail.   **2**

5. The Murphy family are building an extension on their house. Plans are shown below,

4.5m

Living Room

8.8m

Kitchen

2.4m

6.2m

a) Calculate the area of the kitchen **1**

It costs £3.99 per m^2 of tiles for the floor of the kitchen

b) Calculate the cost to put tiles over the entire kitchen floor. **1**

The carpet for the living room must be bought in rolls of 10m^2, where it costs £24 for each roll.

c) Calculate the cost to carpet the entire living room. **4**

A company offers to fit the floor of the kitchen. They tell the Murphy's it would take 3 men 4 hours to complete the work.

d) How long would it take 2 men to complete the same work? **2**

The same company give the Murphy's an overall cost (including materials) of £200. Mr Murphy decides to pay if off with the following offer.
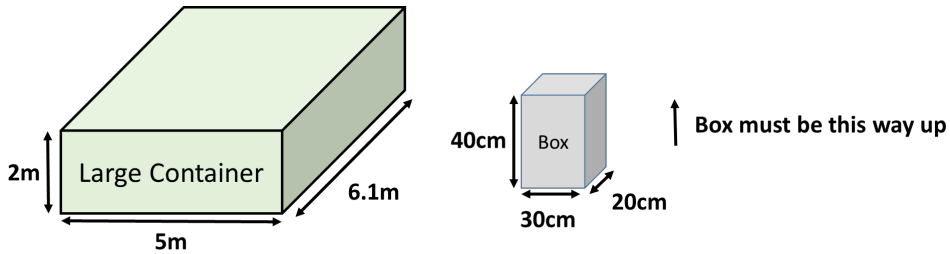
- Pay 25% of the fee up from
- 10 instalments of £10.99
- One final payment

e) How much will the final payment be? **3**

6. Boxes are being stacked into a larger container with dimensions as shown below.

40cm | Box
2m | Large Container
6.1m
30cm | 20cm
5m

Box must be this way up

a) What is the most number of boxes you can fit inside the large
container? **3**

The cost of the large container is £1450. It also costs £1.50 for each box
to be packaged.

b) Calculate the cost to buy the container and package all the boxes. **2**

The large container is being placed on a plane, which is to fly from London to New York. The plane flies 3500 miles at a speed of 400mph.

c) How long in hours and minutes will it take for the plane to make this journey?

2

The plane leaves at 9am from London. New York is 5 hours behind London

d) Calculate the local time of arrival for the plane.

2

7. A group of students time how long in seconds it takes for them to run a 100m race, the times recorded were;

68   77   73   73   78   84

a) Calculate the mean and standard deviation of these times.   **4**

b)   In the next race the mean time was 72.2 seconds and the standard deviation was 2.24. Make two valid comments about the two races.
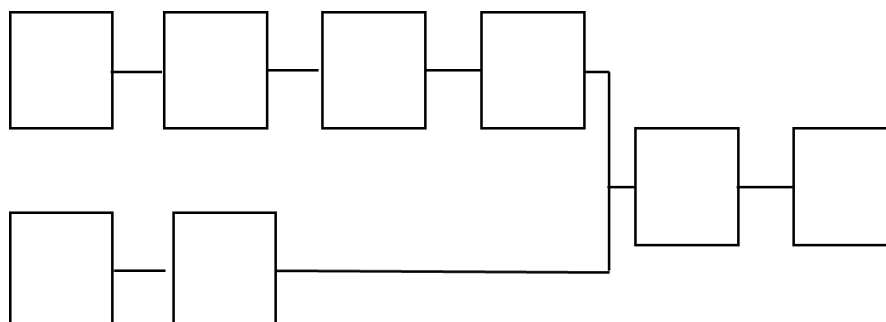
2

8. Helen is doing the washing up, her tasks are listed on the table below.

	Task	Preceding task	Time (minutes)
A	Turn on the water heater.	None	5
B	Put away dry plates.	None	2
C	Turn on water tap to fill the sink.	D	3
D	Put plug into sink.	A	1
E	Collect dirty dishes.	B	2
F	Add washing up liquid.	C	1
G	Wash dishes.	F, E	15
H	Leave to dry.	G	0

a) Complete the following precedence table of the tasks that need completed. **2**

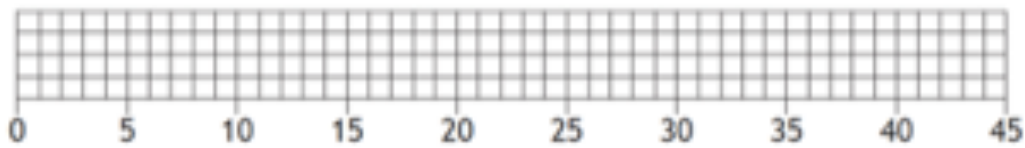b) If Helen starts doing the dishes as 4.12pm then when will she finish? **2**

9. A mobile phone company *PHONES R US* records how many of their phones they sell a day in different cities across the country. The number of phones sold are recorded in the table below.

12	30	24	21	17	24
18	20	26	34	38	23

a) For this data calculate   **2**
     The median
     The lower quartile
     The upper quartile

b) Construct a boxplot of this data.   **2**

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0    5    10   15   20   25   30   35   40   45
```

c) Calculate the Semi-Interquartile Range   **2**

Another mobile phone company *RINGING DEALS* did the same survey.

They were found to have a median of selling 28 phones, and the SIQR of their sales is 8.

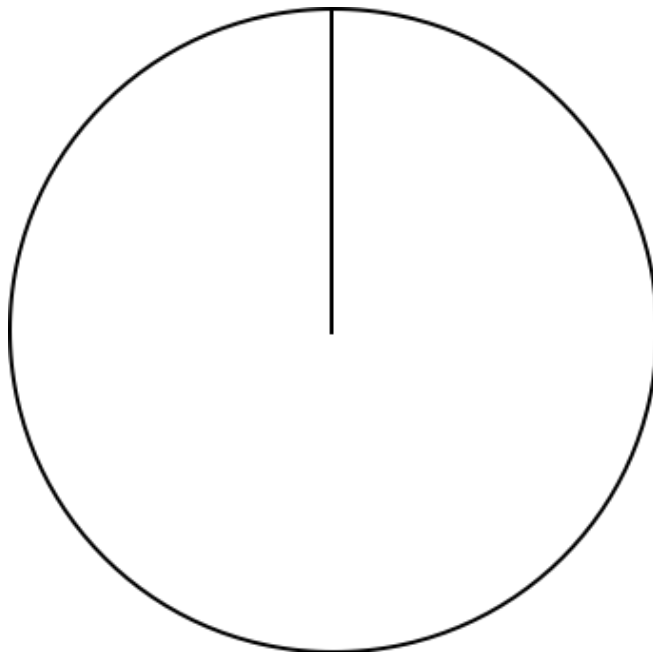d)   Make two valid comparisons between the sales of two mobile phone brands.   **2**

10. A survey on transport to work is carried out.

165 said Walked
130 took the Bus
60 got the Train
95 said by Car

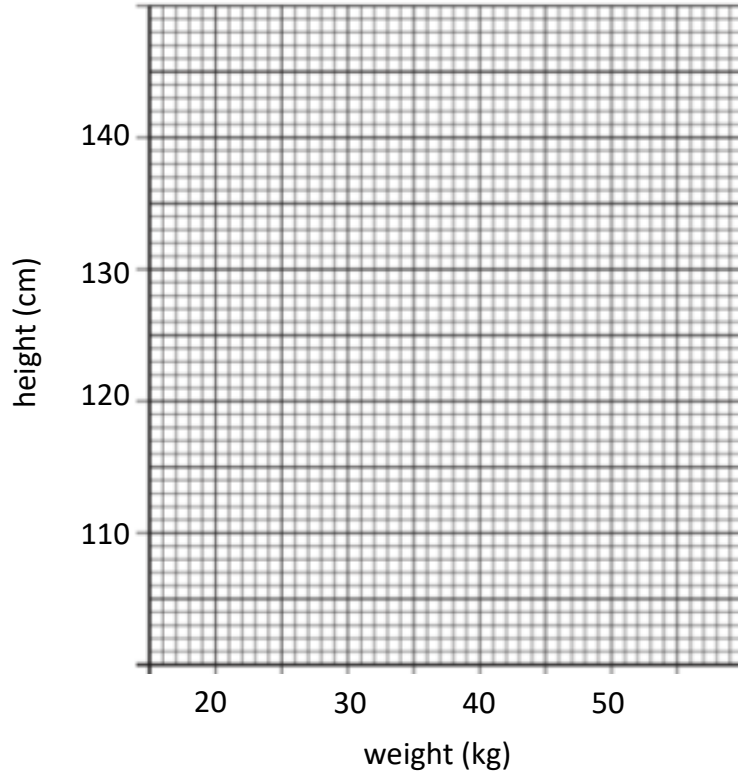Construct a pie chart to illustrate this information. **3**

11. The height and weights of several members of an U15 football team is taken and recorded.

Weight	32	45	40	45	34	36	35	38
Length	112	139	126	128	115	120	122	118

a) On the grid, draw a Scatter Graph   **2**

b) Draw a line of best fit   **1**

Mason measures that he is 1.35m tall.

c)   i) Use your line of best fit to calculate his weight   **1**

A formula is used to work out someone's BMI.

$$BMI = \frac{weight}{(height)^2}$$

If the height is in metres and weight is in kgs.

The following table shows what classification you are based on your BMI.

Underweight	Normal	Overweight	Obese
<18.5	18.5 – 24.9	25 – 29.9	30+

ii)   Use this to calculate Mason's BMI and therefore what classification he falls into.   **2**

This is the end of the paper.