CALC H

GCSE Mathematics · Higher Tier

40 marks · 45 minutes · Calculator

Name ..... **Class** .....

Answer all questions. Show all your working. Diagrams are NOT accurately drawn unless stated.

1 **(a)** The length, L metres, of a bridge is 4700 m, correct to 2 significant figures.
Write down the error interval for L.

.....

(2)

(b) Kim truncates a number, y, to 1 decimal place. The result is 6.4
Write down the error interval for y.

.....

(2)

(Total for Question 1 is 4 marks)

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2 **(a)** Mia says,

"1 m^2 is the same as 100 cm^2."

Is Mia correct? Give a reason for your answer.

.....

.....

(1)

(b) A rectangular floor measures 3.6 m by 2.4 m.
The floor is to be covered with square tiles. Each tile measures 30 cm by 30 cm.
The tiles are sold in packs of 10 Each pack costs £18.50
Work out the cost of the tiles needed to cover the floor.

£ .....

(3)

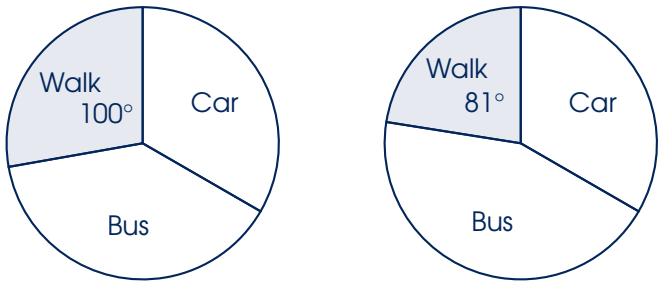
(Total for Question 2 is 4 marks)

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3 Two surveys asked people how they travel to work.

180 people took part in survey **A**. 240 people took part in survey **B**.

The pie charts show the results.



Jo says,

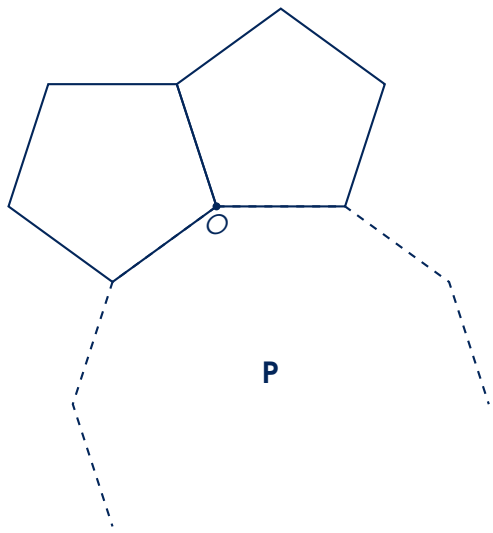
"Fewer people walk to work in survey **B** *than in survey* **A***."*

Is Jo correct? You must show how you get your answer.

(Total for Question 3 is 2 marks)

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4 Two regular pentagons and a regular polygon **P** fit together at a point *O*, with no gaps.



Show that **P** has 10 sides.

(Total for Question 4 is 3 marks)

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5 The total surface area, A, of a solid cylinder with radius r and height h is given by

$$A = 2\pi r^2 + 2\pi rh$$

(a) Make h the subject of the formula.

$h =$ .....

(2)

(b) A solid cylinder has radius 4.5 cm and total surface area 300 cm^2.
Work out the height of the cylinder.
Give your answer correct to 3 significant figures.

..... cm

(2)

(Total for Question 5 is 4 marks)

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6 An alloy is made by mixing 450 g of copper with 30 cm^3 of zinc.
The density of copper is 8.96 g/cm^3. The density of zinc is 7.13 g/cm^3.
Work out the density of the alloy.
Give your answer correct to 3 significant figures.

..... g/cm^3

(Total for Question 6 is 4 marks)

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7 A straight slide of length 4.5 m goes from the top of a vertical post to horizontal ground.
The bottom of the slide is 3.9 m from the bottom of the post.

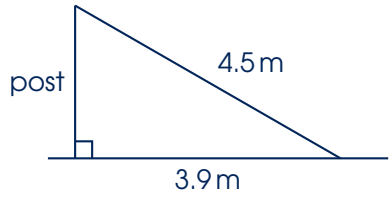


Diagram NOT accurately drawn

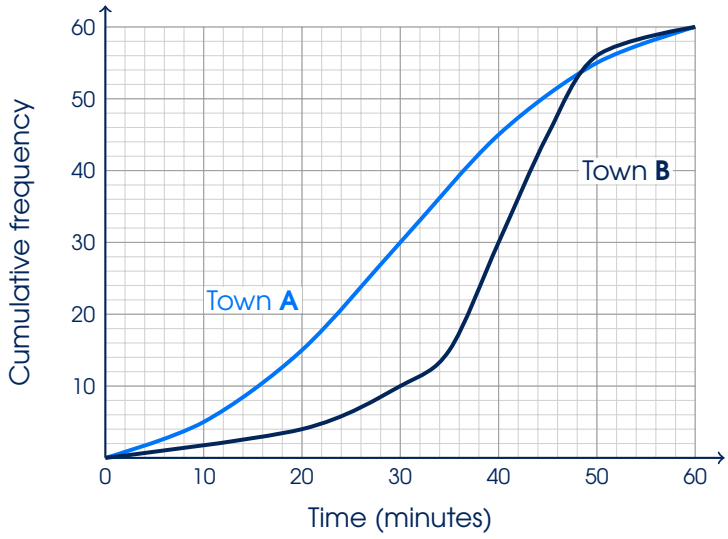
For the slide to meet the safety rules:

- the angle between the slide and the ground must be between 25° and 35°
- the top of the slide must be no more than 2.5 m above the ground.

Does the slide meet both safety rules? You must show all your working.

(Total for Question 7 is 3 marks)

8 The cumulative frequency graphs show information about the times, in minutes, that 60 adults in Town **A** and 60 adults in Town **B** take to travel to work.



(a) Use the graph to find the median time for Town **A**.

..... minutes

(1)

(b) Compare the distribution of the times for Town **A** with the distribution of the times for Town **B**.

.....

.....

(2)

(Total for Question 8 is 3 marks)

9 The number of fish in a lake at the start of year n is P_n

$$P_{n+1} = 0.9P_n + 400 \qquad P_0 = 3000$$

(a) Work out the value of P_3

$P_3 =$ .....

(2)

(b) Ravi says,

"The number of fish will keep increasing until there are more than 5000 fish."

Is Ravi correct? Give a reason for your answer.

.....

.....

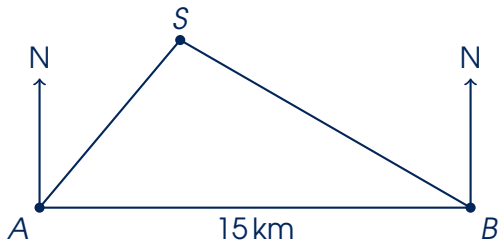
(1)

(Total for Question 9 is 3 marks)

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10 A and B are two coastguard stations. B is 15 km due east of A.

A ship, S, is on a bearing of 040° from A and on a bearing of 300° from B.



Show that the distance AS is 7.62 km, correct to 3 significant figures.

(Total for Question 10 is 3 marks)

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11 **(a)** Solve $x^2 - 4x - 9 < 0$

Give the values in your answer correct to 2 decimal places.

.....

(3)

(b) Write down the largest integer that satisfies $x^2 - 4x - 9 < 0$

.....

(1)

(Total for Question 11 is 4 marks)

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12 Each student in a year group studies French or Spanish or both or neither.

A student is chosen at random from the year group.

The probability that the student studies French is 0.45

The probability that the student studies Spanish is 0.3

The probability that the student studies neither French nor Spanish is 0.35

Given that the student studies Spanish, work out the probability that the student also studies French.

.....

(Total for Question 12 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS