NON-CALC I

GCSE Mathematics · Higher Tier

40 marks · 45 minutes · Non-calculator

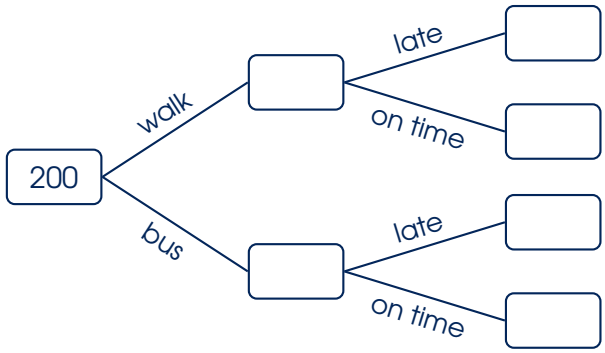
Name ..... **Class** .....

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

1 200 students were asked if they walk or take the bus to school.

120 of the students walk. 15 of the students who walk were late to school last Monday.

25% of the students who take the bus were late to school last Monday.



(a) Complete the frequency tree.

(2)

(b) One of the students who were late is chosen at random.

Work out the probability that this student walks to school.

.....

(1)

(Total for Question 1 is 3 marks)

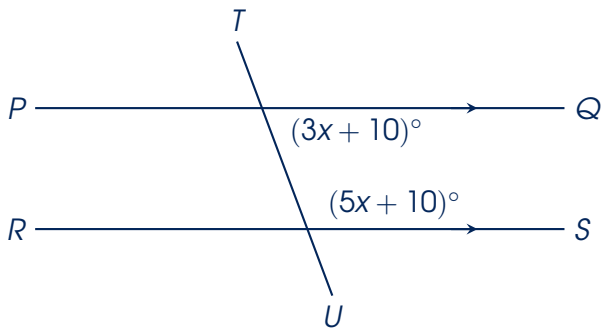
2 A solid metal cuboid measures 6 cm by 5 cm by 4 cm.
The mass of the cuboid is 960 g.
A solid cube is made from the same metal.
The mass of the cube is 1000 g.
Work out the length of one edge of the cube.

..... cm

(Total for Question 2 is 3 marks)

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3 *PQ* and *RS* are parallel straight lines. *TU* is a straight line.



Work out the value of x.
Give a reason for your answer.

$x =$ .....

(Total for Question 3 is 3 marks)

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4 **(a)** Work out the value of $49^{-\frac{1}{2}}$

.....

(1)

(b) Work out the value of $\left(\frac{27}{8}\right)^{-\frac{2}{3}}$

.....

(2)

(c) Find the value of n such that $2^n \times 8 = \frac{1}{4}$

$n =$ .....

(1)

(Total for Question 4 is 4 marks)

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5 The line **L** passes through the points $(2, 5)$ and $(6, -7)$

The point $(k, 20)$ also lies on the line **L**.

Work out the value of k.

$k =$ .....

(Total for Question 5 is 3 marks)

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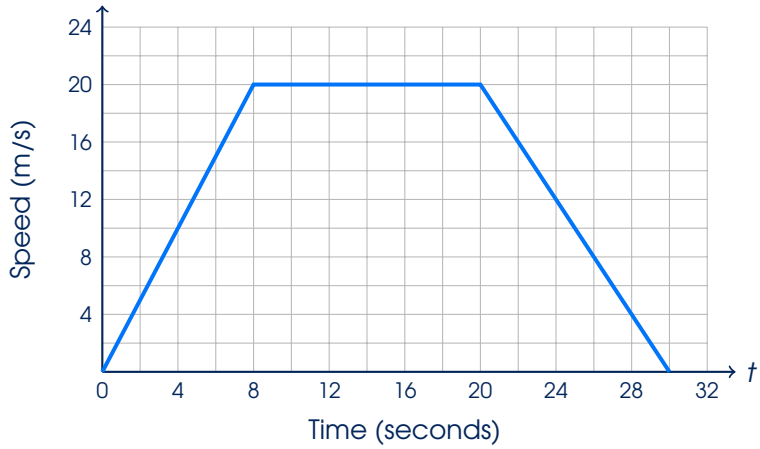
6 There are 12 students in class **A**. The mean score of these students in a test is 15
The mean score of the students in class **B** in the same test is 20
The mean score of all the students in the two classes is 18
Work out the number of students in class **B**.

.....

(Total for Question 6 is 3 marks)

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7 Here is a speed–time graph for a car journey of 30 seconds.



(a) Work out the acceleration of the car during the first 8 seconds.

..... m/s^2

(1)

(b) Work out the average speed of the car for the whole 30 seconds.

..... m/s

(2)

(Total for Question 7 is 3 marks)

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8 **(a)** Factorise $x^2 - y^2$

.....

(1)

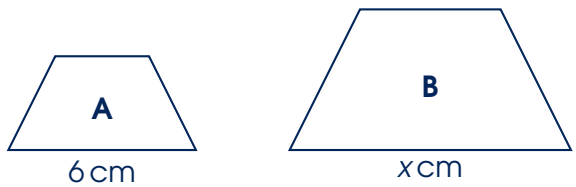
(b) Hence, without using a calculator, show that $1003^2 - 997^2 = 12\,000$

(2)

(Total for Question 8 is 3 marks)

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9 Trapezium **A** and trapezium **B** are mathematically similar.



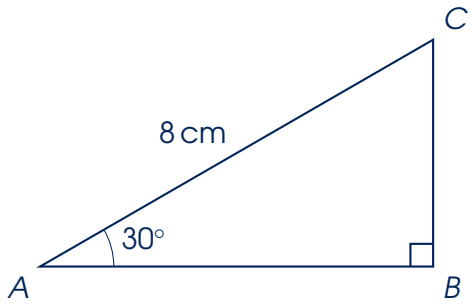
The area of trapezium **A** is $32\,\text{cm}^2$. The area of trapezium **B** is $72\,\text{cm}^2$.
Work out the value of x.

$x =$ .....

(Total for Question 9 is 2 marks)

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10 *ABC* is a right-angled triangle.

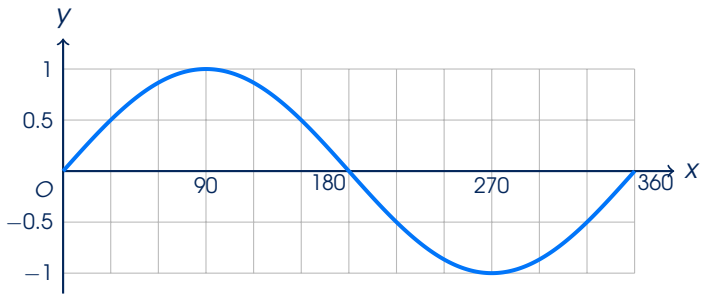


Angle $ABC = 90°$. Angle $BAC = 30°$. $AC = 8$ cm.
Show that the area of triangle ABC is $8\sqrt{3}$ cm^2.

(Total for Question 10 is 3 marks)

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11 Here is the graph of $y = \sin x°$ for $0 \leqslant x \leqslant 360$



$\sin 30° = 0.5$

(a) Write down another value of x, between 0 and 360, for which $\sin x° = 0.5$

.....

(1)

(b) Solve $\sin x° = -0.5$ for $0 \leqslant x \leqslant 360$

.....

(2)

(Total for Question 11 is 3 marks)

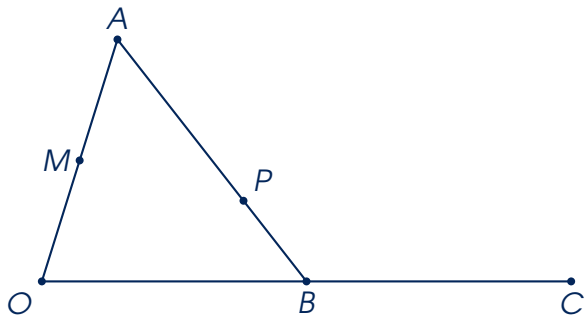
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12 Solve $\frac{3}{x-3}+\frac{4}{x-1}=1$

.....

(Total for Question 12 is 4 marks)

13 OAB is a triangle. $\overrightarrow{OA}=\mathbf{a}$ and $\overrightarrow{OB}=\mathbf{b}$



M is the midpoint of OA. P is the point on AB such that $AP : PB = 2 : 1$

OBC is a straight line and B is the midpoint of OC.

Prove that M, P and C lie on a straight line.

(Total for Question 13 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS