NON-CALC C

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 Work out an estimate for the value of

$$\frac{58.3 \times 4.12}{0.0196}$$

.....

(Total for Question 1 is 2 marks)

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2 Three lights are switched on at the same time at 9 pm.

The red light flashes every 12 seconds.

The green light flashes every 20 seconds.

The blue light flashes every 45 seconds.

All three lights flash together at 9 pm.

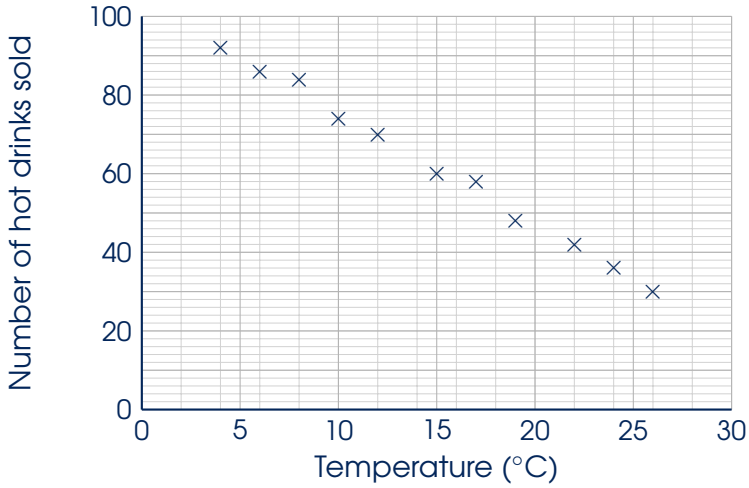
How many more times will all three lights flash together, up to and including 10 pm?

.....

(Total for Question 2 is 3 marks)

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3 The scatter graph shows information about the midday temperature and the number of hot drinks sold at a café on each of 11 days.



(a) Describe the relationship shown by the scatter graph.

.....

(1)

(b) On another day the midday temperature was 14°C.
Use a line of best fit to estimate the number of hot drinks sold on that day.

.....

(1)

(c) Explain why it may not be reliable to use the graph to estimate sales on a 35°C day.

.....

.....

(1)

(Total for Question 3 is 3 marks)

4 Kai is asked to make x the subject of the formula $y = \frac{5x^2}{3} - 4$

Here is his working.

$$3y = 5x^2 - 4$$
$$3y + 4 = 5x^2$$
$$x = \sqrt{\frac{3y+4}{5}}$$

(a) Describe the mistake that Kai has made.

.....

.....

(1)

(b) Make x the subject of $y = \frac{5x^2}{3} - 4$ correctly.

$x =$ .....

(2)

(Total for Question 4 is 3 marks)

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5 Ravi drives 45 km at an average speed of 60 km/h.

He then stops for 15 minutes.

He then drives a further 75 km at an average speed of 50 km/h.

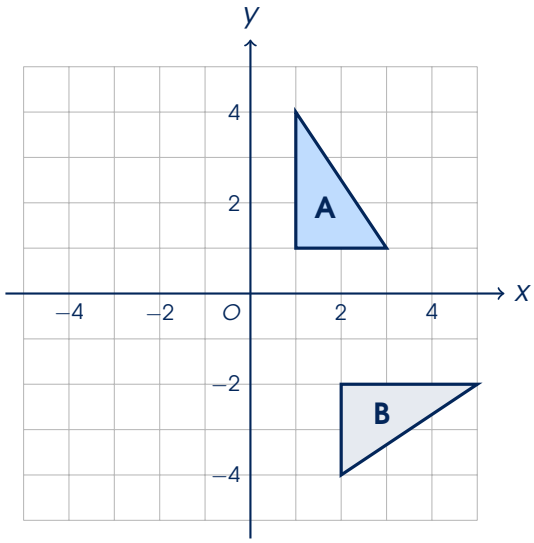
Work out Ravi's average speed for the whole journey, including the stop.

..... km/h

(Total for Question 5 is 4 marks)

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6 Shape **A** and shape **B** are drawn on the grid.



Describe fully the single transformation that maps shape **A** onto shape **B**.

.....

.....

(Total for Question 6 is 3 marks)

7 **(a)** Solve $-7 < 3x + 2 \leqslant 11$

.....

(2)

(b) n is an integer that satisfies $-7 < 3n + 2 \leqslant 11$

Write down all the possible values of n.

.....

(1)

(Total for Question 7 is 3 marks)

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8 A passcode is made of a letter followed by three digits.

The letter is one of A, B, C, D, E or F.

Each digit is chosen from 0 to 9. No digit can be used more than once.

Jo says,

"There are more than 5000 different passcodes."

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

(Total for Question 8 is 2 marks)

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9 Here are the first five terms of a quadratic sequence.

4 11 22 37 56

Find an expression, in terms of n, for the nth term of the sequence.

.....

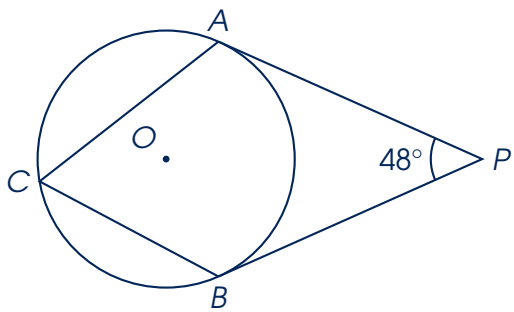
(Total for Question 9 is 3 marks)

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10 A and B are points on a circle, centre O.

PA and PB are tangents to the circle. C is a point on the circle.

Angle $APB = 48°$



Work out the size of angle ACB.

Give a reason for each stage of your working.

..... °

(Total for Question 10 is 4 marks)

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11 Show that $\dfrac{x^2-9}{2x^2+5x-3} \div \dfrac{x-3}{4x-2}$ simplifies to 2 for all values of x for which it is defined.

(Total for Question 11 is 3 marks)

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12 y is inversely proportional to x.

When $x = 6,\ y = 10$

(a) Find a formula for y in terms of x.

.....

(2)

(b) When $x = a,\ y = a - 7$, where a is positive.

Work out the value of a.

$a =$ .....

(2)

(Total for Question 12 is 4 marks)

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13 120 students each chose one activity: climbing, kayaking or archery.

64 of the students are boys.

20 of the girls chose climbing. 25 of the boys chose kayaking.

The number of girls who chose archery is twice the number of girls who chose kayaking.

41 of the students chose archery.

A student who chose archery is picked at random.

Work out the probability that this student is a boy.

You may use the two-way table to help you.

	Climbing	Kayaking	Archery	Total
Boys				
Girls				
Total				

.....

(Total for Question 13 is 3 marks)

TOTAL FOR PAPER IS 40 MARKS