CALC B

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)** Use your calculator to work out the value of

$$\frac{\sqrt{18.4} + 3.7^2}{2.6 \times 0.45}$$

Write down all the figures on your calculator display.

.....

(1)

(b) Write your answer to part (a) correct to 3 significant figures.

.....

(1)

(Total for Question 1 is 2 marks)

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2 The same pair of headphones is sold in three countries.

UK	France	USA
£149	€172	$189

The exchange rates are £1 = €1.16 and £1 = $1.27

In which country are the headphones cheapest?

You must show how you get your answer.

(Total for Question 2 is 3 marks)

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3 The table gives information about the masses of 40 parcels.

Mass (m kg)	Frequency
$0 < m \leqslant 1$	6
$1 < m \leqslant 2$	11
$2 < m \leqslant 3$	13
$3 < m \leqslant 4$	7
$4 < m \leqslant 5$	3

Ella says,

"An estimate for the mean mass of the parcels is more than 2.5 kg."

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

(Total for Question 3 is 3 marks)

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4 The mass of one grain of sand is 6.7×10^{-4} grams.

A bag contains 3.2×10^{7} grains of sand.

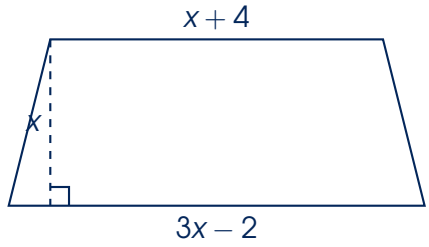
Work out the mass of the sand in the bag. Give your answer in kilograms.

..... kg

(Total for Question 4 is 2 marks)

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5 The diagram shows a trapezium. All measurements are in centimetres.



The area of the trapezium is $36\,\text{cm}^2$.

(a) Show that $2x^2 + x - 36 = 0$

(2)

(b) Work out the length of the longer parallel side of the trapezium.

..... cm

(2)

(Total for Question 5 is 4 marks)

6 Ali buys a car for £18 500

The value of the car depreciates by 12% each year.

After how many years will the value of the car first be less than £9000?

.....

(Total for Question 6 is 3 marks)

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7 A sequence is defined by the term-to-term rule $u_{n+1} = 1.5u_n + 2$

$u_1 = 4$

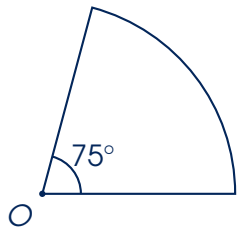
Work out the value of u_4.

$u_4 =$ .....

(Total for Question 7 is 2 marks)

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8 The diagram shows a sector of a circle, centre O.



The angle of the sector is 75°. The area of the sector is 60 cm^2.

Work out the perimeter of the sector.

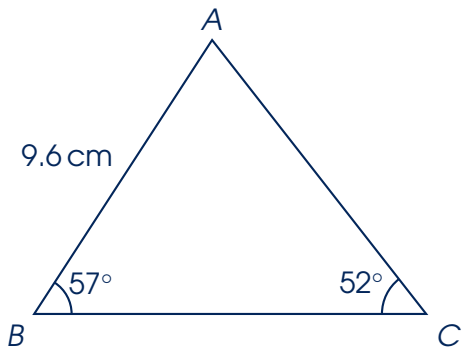
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 8 is 3 marks)

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9 ABC is a triangle.



$AB = 9.6$ cm. Angle $ABC = 57°$. Angle $ACB = 52°$.

Work out the length of BC.

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 9 is 3 marks)

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10 A drink is made by mixing 350 cm^3 of fruit juice with 120 g of syrup.

The density of the fruit juice is 1.05 g/cm^3.

The density of the syrup is 1.33 g/cm^3.

Work out the density of the drink.

Give your answer correct to 3 significant figures.

..... g/cm^3

(Total for Question 10 is 3 marks)

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11 Solve algebraically the simultaneous equations

$$y = 2x^2 - 3x - 4$$
$$y = x + 1$$

Give your solutions correct to 2 decimal places.

.....

(Total for Question 11 is 4 marks)

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12 Two containers, **P** and **Q**, are mathematically similar.

The volume of **P** is 640 cm^3. The volume of **Q** is 2160 cm^3.

The height of **P** is 15 cm.

Kim says,

*"The height of **Q** is* $15 \times \frac{2160}{640}$*, which is about 50.6 cm."*

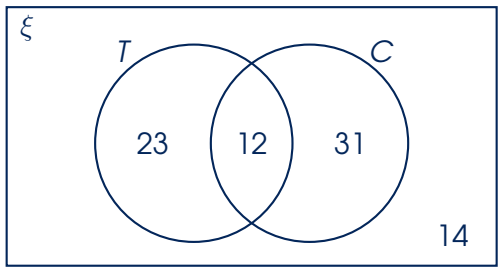
Is Kim correct? You must show how you get your answer.

(Total for Question 12 is 3 marks)

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13 The Venn diagram shows information about the drinks that 80 people like.

ξ = 80 people T = people who like tea C = people who like coffee



One of the people who like coffee is chosen at random.

Mo says the probability that this person also likes tea is $\frac{12}{80}$

(a) Explain the mistake Mo has made.

.....

(1)

(b) Work out the correct probability.

.....

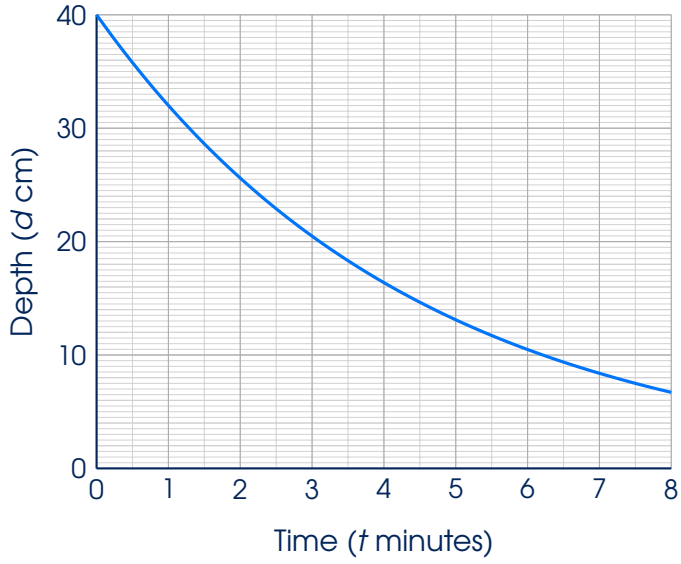
(2)

(Total for Question 13 is 3 marks)

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14 Water is let out of a bath.

The graph shows the depth, d cm, of water in the bath t minutes after the water starts to drain.



Estimate the rate at which the depth of water is decreasing when $t = 3$

You must show how you get your answer.

..... cm/min

(Total for Question 14 is 2 marks)

TOTAL FOR PAPER IS 40 MARKS