GCSE (9 – 1) Mathematics

J560/04 Paper 4 (Higher Tier)

Question Set 4

1 Carol makes birthday cards.
Each card takes the same amount of time to make.

She makes 3 cards in 48 minutes.
She has an order for 80 cards.

Can she complete this order in 3 days if she works 8 hours each day?
Show how you decide.

..... because .....

..... **[5]**

2 Use the formula $F = \frac{s}{\sqrt{tm}}$ to find the value of F when

$$s = 5.8 \times 10^{6}$$
$$t = 4.1 \times 10^{8}$$
$$m = 3.7 \times 10^{-2}.$$

Give your answer in standard form, correct to 2 significant figures.

..... **[4]**

3 At a railway station, trains are either eastbound or westbound.
An eastbound train leaves the station every 25 minutes.
A westbound train leaves the station every 45 minutes.

An eastbound train and a westbound train both leave the station at 8 am.

When is the next time that two trains leave the station together?

..... **[4]**

4 Multiply out and simplify.

$(4x + y)(x - 3y)$

..... **[3]**

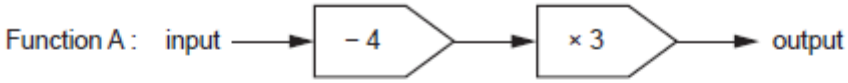
5 A bag of sweets contains only mints, sherberts and toffees.

The ratio of the number of mints to sherberts is 2 : 3.
The ratio of the number of sherberts to toffees is 7 : 5.

What fraction of the sweets are sherberts?

..... **[3]**

6 **(a)** Here is function A.



(a) A number, k, is input into function A.
The output is also k.

Find the value of k.

(a) $k =$ ..... **[3]**

(b) The output of function A is y.

Write an algebraic expression, in terms of y, for the input of function A.

(b) ..... **[2]**

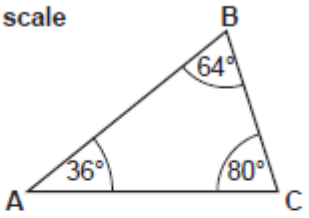
(c) The diagram shows a composite function with an input, n, and an output of 96.

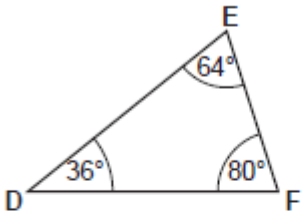
Find the value of n.

(c) $n =$ ..... **[2]**

7 **(a)** Are these two triangles definitely congruent?
Give a reason.

Not to scale





..... because .....

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..... **[1]**

(b) Prove that these two triangles are congruent.

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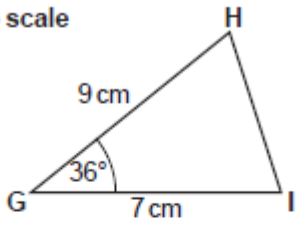

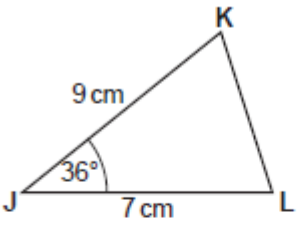

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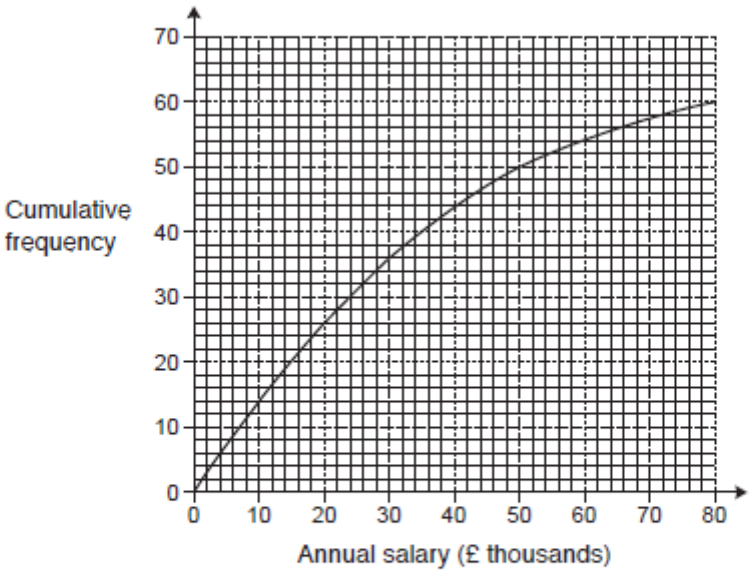
..... **[3]**

8 **(a)** The cumulative frequency graph summarises the annual salary, p (£ thousands), of the 60 workers in a factory.



(a) Use the graph to estimate the median annual salary.

(a) £ ..... thousands **[1]**

(b) Complete this cumulative frequency table.

Annual salary, p (£ thousands)	**Cumulative frequency**
$p \leqslant 10$	
$p \leqslant 20$	
$p \leqslant 30$	
$p \leqslant 50$	
$p \leqslant 80$	

[2]

(c) Use the information in the cumulative frequency table to calculate an estimate of the mean annual salary.

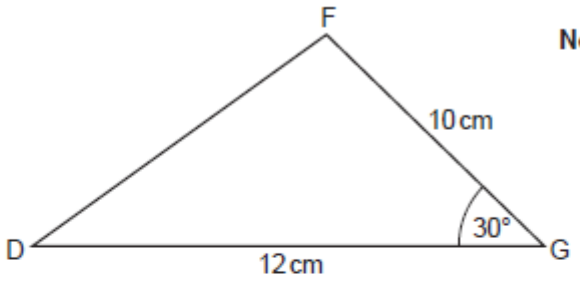
(c) £ ..... thousands **[5]**

(d) Explain why your estimate of the median is more reliable than your estimate of the mean.

.....

..... **[1]**

9 **(a)** Calculate length DF in this triangle.



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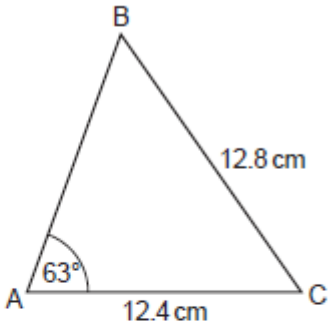
(a) ..... cm **[3]**

(b) Calculate angle ACB in this triangle.



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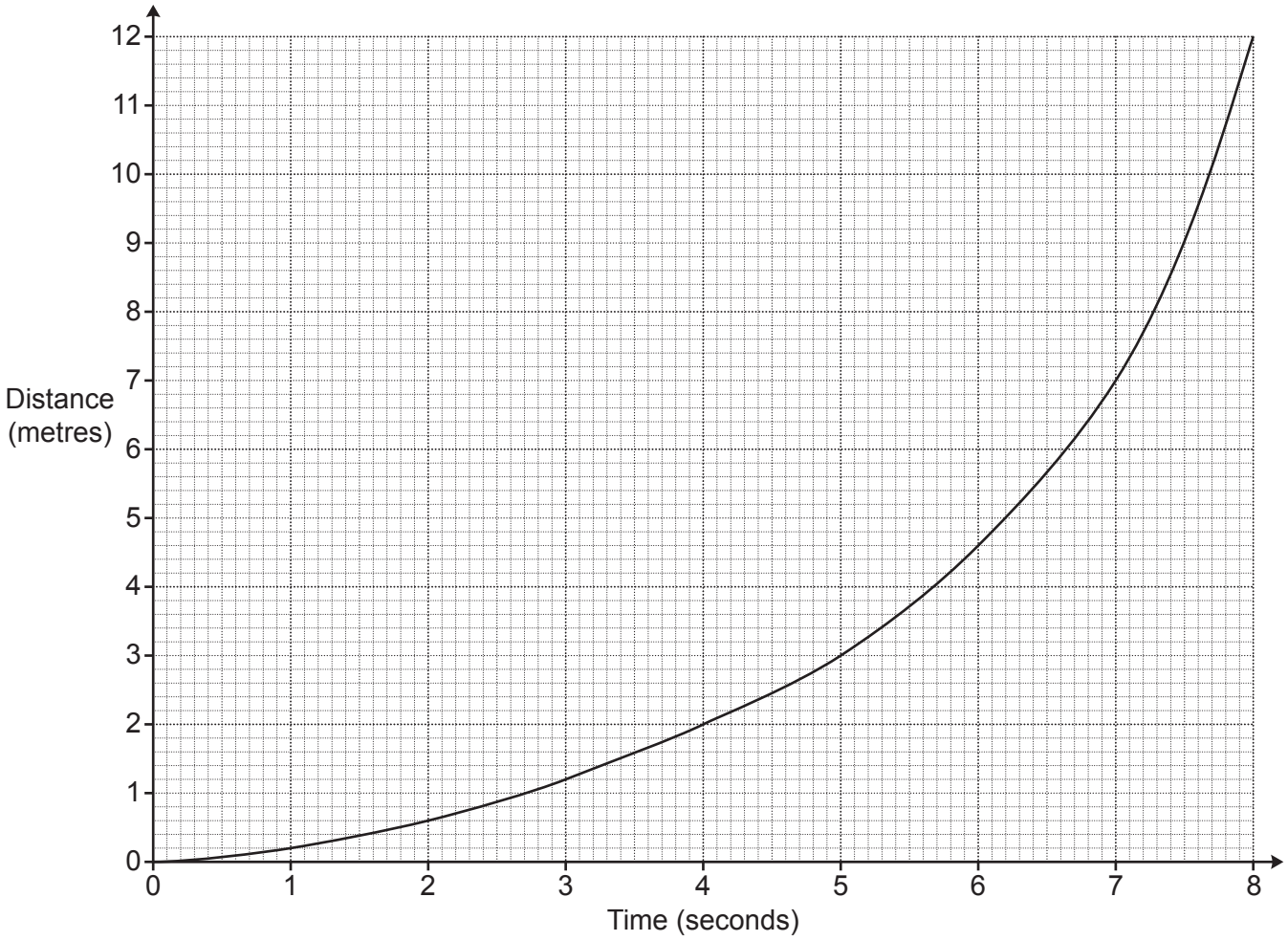
(b) .....° **[4]**

10 The graph shows the distance travelled by a particle over 8 seconds.



Estimate the speed of the particle at 5 seconds.

..... m/s **[4]**

Total Marks for Question Set 4: 50