OCR
Oxford Cambridge and RSA

GCSE (9 – 1) Mathematics

J560/04 Paper 4 (Higher Tier)

Question Set 4

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.

26.6 (3c = 48, 80c = 1280) 26.6

8 × 60 = 480

480 × 3 = 1440

1. yes because it will take her 1280 mins over the three days and there are 1440 mins available 1440 > 1280 [5]

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.

$$\frac{5.8 \times 10^{6}}{\sqrt{(4.1 \times 10^{8}) \times (3.7 \times 10^{-2})}}$$

1489.139

1.5×10^{3} [4]

2

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?

LMC of 25, 45 = 225 mins

225 ÷ 60 = 3.75 hrs

60 × 0.75 = 45 min

3h 45 m

11.45 am [4]

3

Multiply out and simplify.

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

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

$4x^2 - 12xy + xy - 3y^2$

$4x^2 - 11xy - 3y^2$

$4x^2 - 11xy - 3y^2$ [3]

4

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?

$2:3 \rightarrow$ & $7:5 \rightarrow \frac{14}{3} : 7 : 5$

$7:5 \rightarrow$

$\frac{3}{5} \times \frac{7}{12} = \frac{7}{2120}$

$\frac{7}{20}$

[3]

5

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.

① $3(k-4) = k \quad = 3k - 12 = k$ ③

② $\frac{k}{3} + 4 = k \quad = 3k + 36 = 9k$ ④

④ − ③ $= 48 = 8k$

$6 = k$

(a) $k =$ 6 **[3]**

(b) The output of function A is y.

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

$\text{input} = \frac{y}{3} + 4$

(b) $y/3 + 4$ **[2]**

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

Find the value of n.

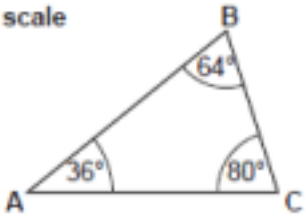
$\left(\frac{96}{3}\right) + 4 = 36$

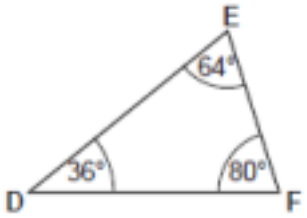
$\left(\frac{36}{3}\right) + 4 = 16$

(c) $n =$ 16 **[2]**

Are these two triangles definitely congruent?
Give a reason.

Not to scale



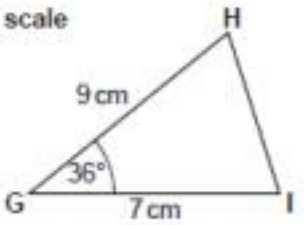


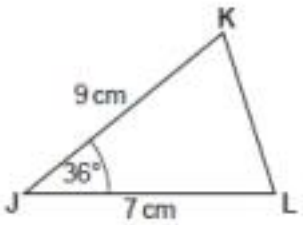
NO because it does not follow ASA, SAS, AAS rules the triangles may be similar, but not congruent

7 (a) [1]

(b) Prove that these two triangles are congruent.

Not to scale

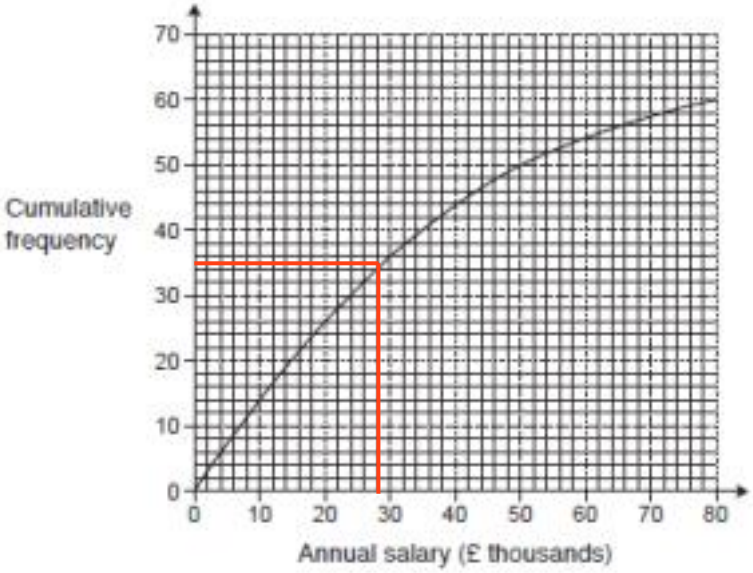




The side GH and JK are the same - this is given
Angle ∠HGI & ∠KJL are the same which is given. The side HI and JL are the same which is given
Therefore due to SAS the triangles are congruent

[3]

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.

8 (a) **(a)** £ 28 thousands **[1]**

(b) Complete this cumulative frequency table.

Annual salary, p (£ thousands)	Cumulative frequency	AF	P×AF
$p \leqslant 10$	15	15	150
$p \leqslant 20$	26	11	220
$p \leqslant 30$	36	10	300
$p \leqslant 50$	50	14	700
$p \leqslant 80$	60	10	800

[2]

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

Total = 2170

$\frac{2170}{60} = 36.16$

mean

(c) £ 36.17 thousands [5]

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

because the line is not linear

..... [1]

9 (a) **(b)**

10 **Total**

Marks for Question Set 4: 50