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H

GCSE (9–1) Mathematics

J560/06 Paper 6 (Higher Tier)

Practice Paper

Date – Morning/Afternoon

Time allowed: 1 hour 30 minutes

You may use:
- A scientific or graphical calculator
- Geometrical instruments
- Tracing paper

First name									
Last name									
Centre number						**Candidate number**				

INSTRUCTIONS
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully before you start your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- This document consists of **16** pages.

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Answer **all** the questions

1 A bakery bakes small, medium and large pies.
The ratio small : medium : large is 3 : 5 : 2.

(a) What fraction of the pies are large?

(a) ..... **[1]**

(b) One day 460 medium pies are baked.

Work out how many small pies are baked.

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

2 A triangle has sides of length 23.8 cm, 31.2 cm and 39.6 cm.

Is this a right-angled triangle?
Show how you decide.

.....

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

3 **(a)** Solve.

$$4x - 7 = 8 - 2x$$

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

(b) Solve this inequality.

$$5x + 9 > 13$$

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

(c) Rearrange this formula to make x the subject.

$$y = \sqrt{4x - 3}$$

(c) ..... **[3]**

4 John is going to drive from Cambridge to Newcastle.



(a) John needs to be in Newcastle at 11 am.
He drives at an average speed of 60 miles per hour.

What time does he need to leave Cambridge?

(a) ..... **[5]**

(b) State one assumption you have made.
Explain how this has affected your answer to part **(a)**.

.....

.....

.....

..... **[2]**

5 When water freezes into ice its volume increases by 9%.

What volume of water freezes to make 1962 cm^3 of ice?

..... cm^3 **[3]**

6 The table shows data for the UK about its population and the total amount of money spent on healthcare in 2002, 2007 and 2012.

Year	Population	Total spent on healthcare (£)
2002	5.94×10^7	8.14×10^{10}
2007	6.13×10^7	1.20×10^{11}
2012	6.37×10^7	1.45×10^{11}

(a) How much more was spent on healthcare in 2007 than in 2002?
Give your answer in millions of pounds.

(a) £ ..... million **[3]**

(b) Marcia says

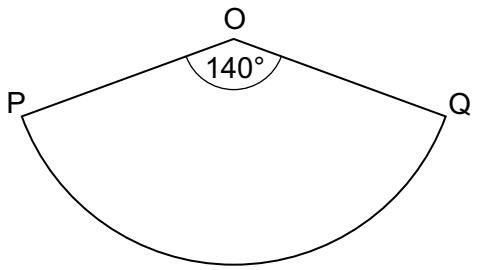
The amount spent on healthcare **per person** in the UK doubled in 10 years.

Use the information in the table to comment on whether Marcia is correct.

.....

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

7 OPQ is a sector of a circle, centre O and radius 9 cm.



Not to scale

Find the perimeter of the sector.
Give your answer in terms of π.

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

8 **(a)** Write down the reciprocal of 8.

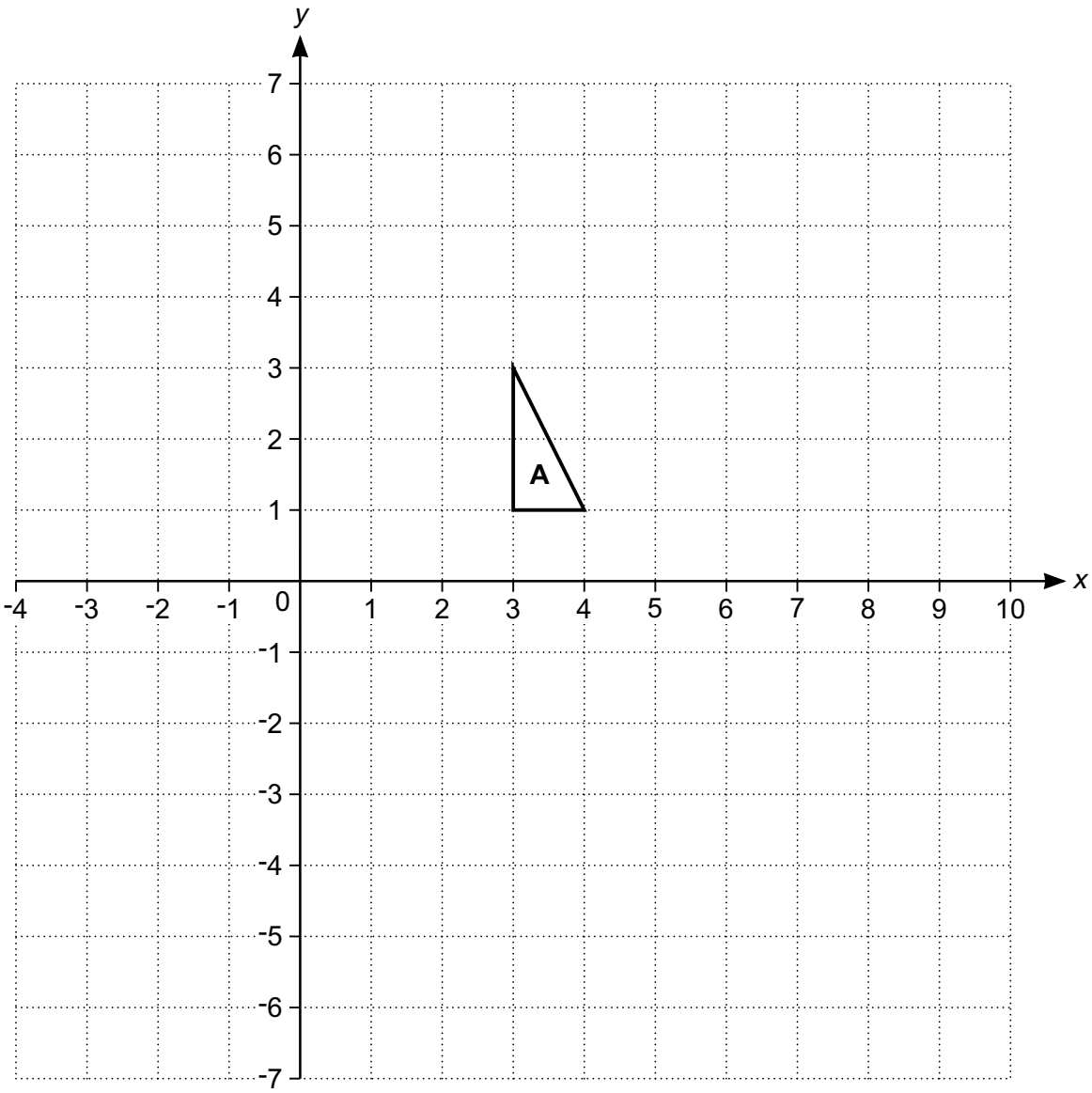
(a) ..... **[1]**

(b) Work out the value of k.

$$4^5 \times 2^{-4} = 2^k$$

(b) ..... **[3]**

9 Triangle **A** is drawn on the coordinate grid.



Zara and Sam each transform triangle **A** onto triangle **B**.

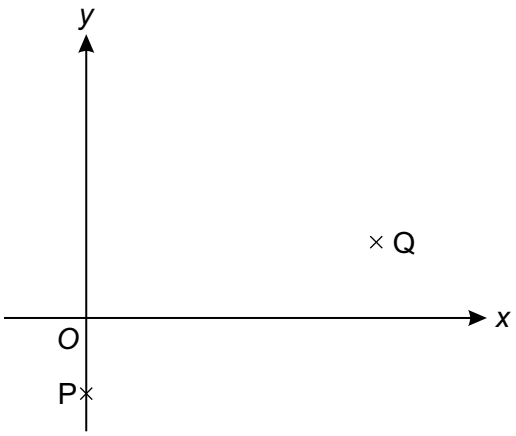
- Zara uses a rotation of 90° clockwise about the origin **followed by** a reflection in $x = 3$.
- Sam uses a reflection in $y = -x$ **followed by** a transformation T.

(a) Draw and label triangle **B**. **[3]**

(b) Describe fully transformation T.

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

10 P has coordinates $(0, -1)$ and Q has coordinates $(4, 1)$.



Not to scale

(a) Find the equation of line PQ.

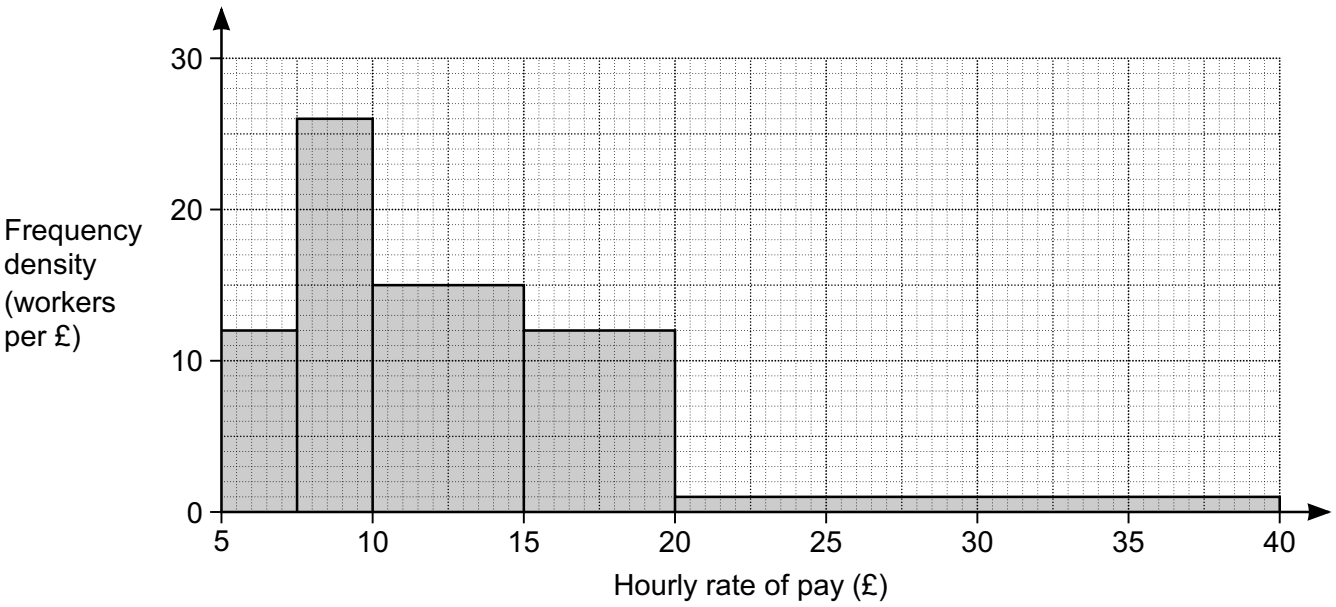
(a) ..... **[3]**

(b) P and Q are two vertices of rectangle PQRS.

Find the equation of line QR.

(b) ..... **[3]**

11 Omar surveyed a group of workers to find their hourly rate of pay.
His results are summarised in the histogram.



(a) Show that Omar surveyed 250 workers. **[3]**

(b) The UK living wage is £7.85 per hour.
A newspaper states that one fifth of workers earn less than the living wage.

(i) Does Omar's survey support the statement in the newspaper?
Show how you decide.

.....

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

(ii) Explain why your calculations in part **(b)(i)** may not give the exact number of workers earning less than the living wage.

.....

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

(c) Omar used this table to record the ages of the people in his survey.

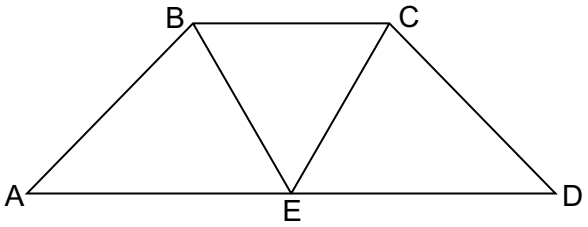
Age (a years)	$18 \leqslant a \leqslant 20$	$20 \leqslant a \leqslant 30$	$30 \leqslant a \leqslant 40$	$40 \leqslant a \leqslant 50$	$50 \leqslant a \leqslant 70$

Comment on one problem with his table.

.....

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

12 The diagram shows trapezium ABCD.
E is the midpoint of AD.
BCE is an equilateral triangle.



Not to scale

Prove that triangle ABE is congruent to triangle DCE.

.....

.....

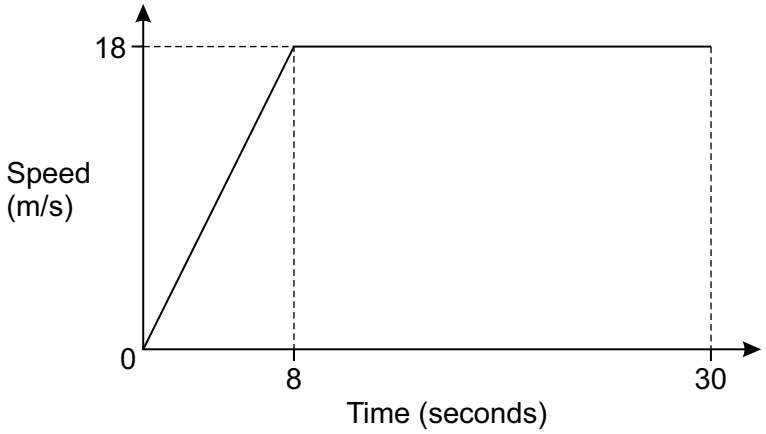
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.....

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

13 **(a)** The graph shows the speed of a car during the first 30 seconds of its journey.



(i) State the acceleration of the car after 20 seconds.

(a)(i) ..... m/s^2 **[1]**

(ii) Find the total distance travelled by the car in the 30 seconds.

(ii) ..... m **[3]**

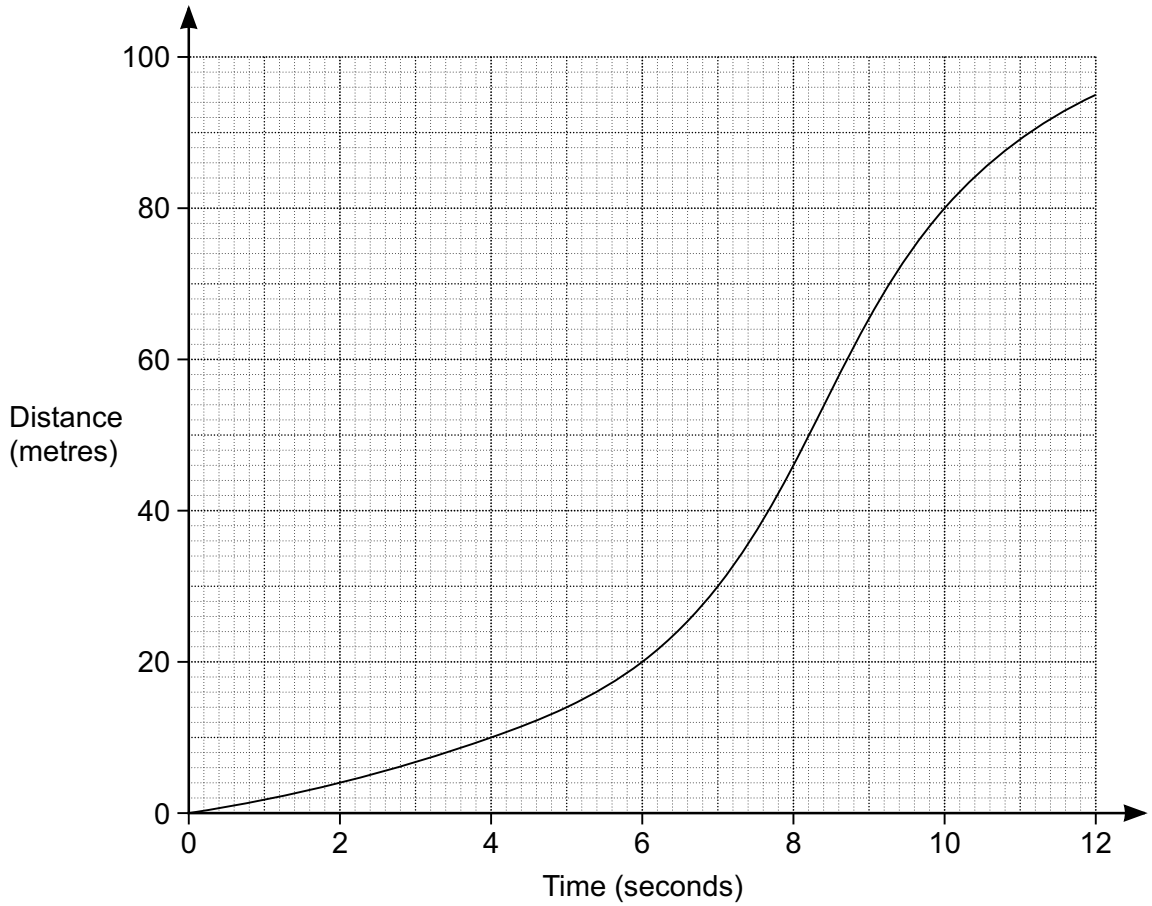
(b) The speed v of a train is 68 km/h, correct to the nearest km/h.

Write down an inequality to show the error interval for v.

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

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(c) The graph shows the distance travelled by a lorry in 12 seconds.



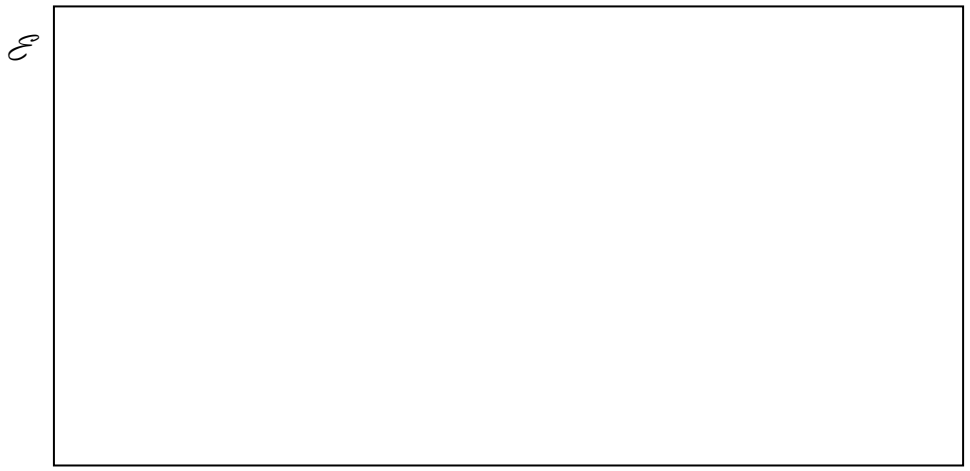
Estimate the speed of the lorry after 5 seconds.

(c) ..... m/s **[4]**

14 An activity camp has climbing and sailing classes.

- 50 children attend the activity camp.
- 35 children do climbing.
- 10 children do both classes.
- 2 children do neither class.

(a) Represent this information on a Venn diagram.



[3]

(b) A child attending the activity camp is selected at random.

Find the probability that this child

(i) did exactly one class,

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

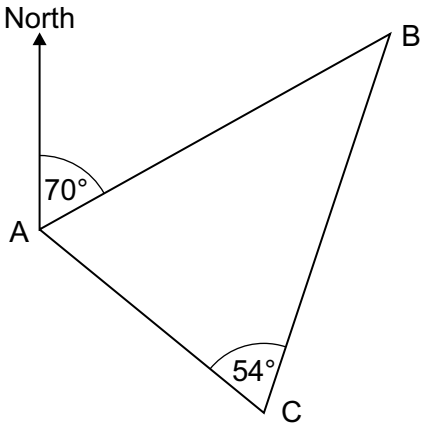
(ii) did sailing, given that they did not do climbing.

(ii) ..... **[2]**

15 Show that

$$\frac{4}{x-3} - \frac{2}{x+1} = \frac{2(x+5)}{(x-3)(x+1)}.$$ **[3]**

16 The diagram shows the positions of three hills, A, B and C.



Not to scale

B is 23 km from A on a bearing of 070°.
C is 15 km from A.
Angle ACB = 54°.

Find the bearing of C from A.

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

17 A cuboid has length x cm.
The width of the cuboid is 4 cm less than its length.
The height of the cuboid is half of its length.

(a) The surface area of the cuboid is 90 cm^2.

Show that $2x^2 - 6x - 45 = 0$. **[5]**

(b) Work out the volume of the cuboid.

(b) ..... cm^3 **[6]**

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