Candidate surname

Other names

**Pearson Edexcel
Level 1/Level 2 GCSE (9–1)**

Centre Number

Candidate Number

Mock Set 6 – Spring 2021

Time: 1 hour 30 minutes

Paper Reference **1MA1/2H**

Mathematics

**Paper 2 (Calculator)
Higher Tier**

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

S 6 8 5 9 1 A 0 1 2 4

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Work out the reciprocal of 0.8

....

(1)

(b) Work out $\dfrac{\sqrt{7.4 - 2.5^2}}{5.6 + 7.2}$

Write down all the figures on your calculator display.

....

(2)

(Total for Question 1 is 3 marks)

2 In a box there are only red beads, green beads, yellow beads and pink beads.

The table shows each of the probabilities that, when a bead is taken at random from the box, the colour of the bead is red or is green.

Colour	red	green	yellow	pink
Probability	0.16	0.2		

The number of yellow beads is the same as the number of pink beads.

Vera is going to take at random one bead from the box and put the bead back in the box.

(a) Work out the probability that Vera will take a pink bead.

....

(2)

Cathy is going to take a bead from the box.
She will record the colour of the bead and put the bead back in the box.
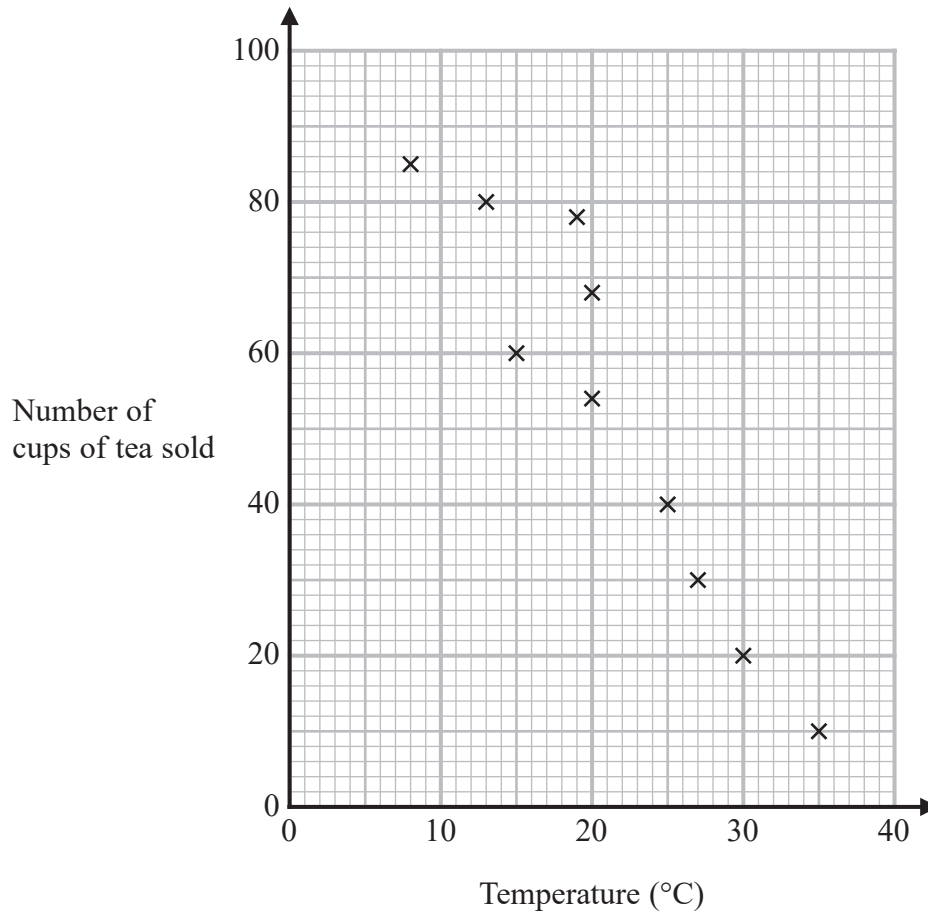Cathy will do this 50 times.

(b) Work out an estimate for the number of times she will take a red bead from the box.

....

(2)

(Total for Question 2 is 4 marks)

3 The scatter graph shows information about the number of cups of tea sold by a cafe each day and the temperature at noon that day.

On a different day 46 cups of tea were sold and the temperature at noon was 22°C

(a) Show this information on the scatter graph.

(1)

(b) What type of correlation does the scatter graph show?

....
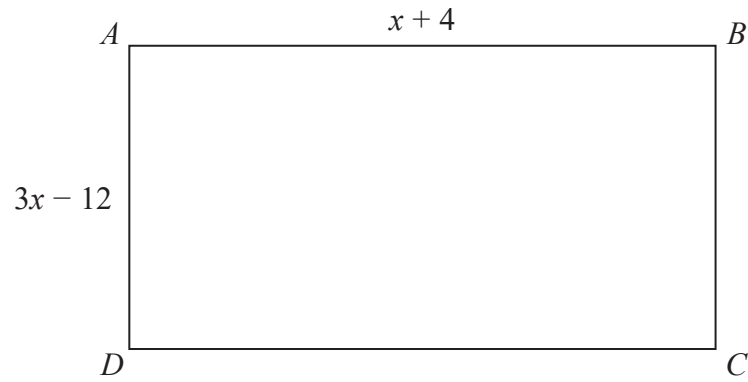
(1)

On a Tuesday the temperature at noon is expected to be 10°C

(c) Using the scatter graph, find an estimate for the number of cups of tea the cafe can expect to sell on this Tuesday.

....

(2)

(Total for Question 3 is 4 marks)

4 *ABCD* is a rectangle.

```
        A              x + 4                B
         ┌─────────────────────────────────┐
         │                                  │
3x − 12  │                                  │
         │                                  │
         └─────────────────────────────────┘
        D                                    C
```

All measurements are in centimetres.

The perimeter of the rectangle is 38 cm.

(a) Work out the length of *AD*.

.... cm

(4)

Jamal says,

"If I double the value of *x* then the perimeter of the rectangle will double."

(b) Is Jamal correct?
You must give a reason for your answer.

....

....

....

(1)

(Total for Question 4 is 5 marks)

Turn over ▶

5 Here are the equations of five straight lines.

$$y = 3 \qquad y = 3x + 2 \qquad 3y = x + 2 \qquad x = 3 \qquad x + 3y = 2$$

Each of these straight lines is parallel to the x-axis or is parallel to the y-axis or has a positive gradient or has a negative gradient.

Complete the following table by placing a tick ($\checkmark$) in the correct column for each equation.

Equation	Line parallel to the x-axis	Line parallel to the y-axis	Line with positive gradient	Line with negative gradient
$y = 3$				
$y = 3x + 2$				
$3y = x + 2$				
$x = 3$				
$x + 3y = 2$				

(Total for Question 5 is 3 marks)

6 *ABCD* is a rectangle.

15 cm

A   *B*

17 cm

E

D   *C*
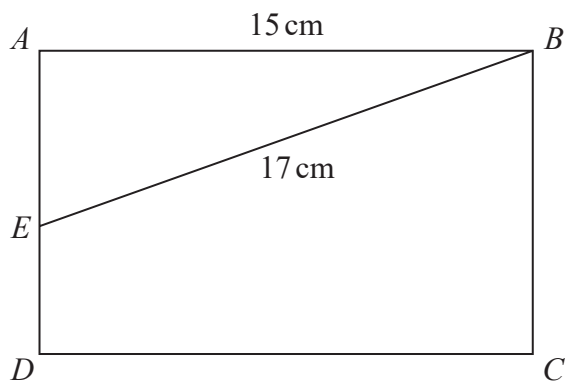
E is the point on *AD* such that $AE:ED = 4:3$

Work out the area of the rectangle.

.... cm^2

(Total for Question 6 is 5 marks)

Turn over ▶

7 The mass of $\frac{1}{2}$ pint of milk is 303 g.

1 pint is 0.568 litres
$1000 \, \text{cm}^3 = 1$ litre

Work out the density of the milk.
Give your answer in g/cm³

.... g/cm³

(Total for Question 7 is 3 marks)

8 Selina invests £2000 in a savings account for 3 years.
The account pays compound interest at a rate of 2.5% per annum.

Calculate the total amount of interest Selina will get by the end of the 3 years.

£..

(Total for Question 8 is 3 marks)

9 The diagram shows the right-angled triangle *ABC*.
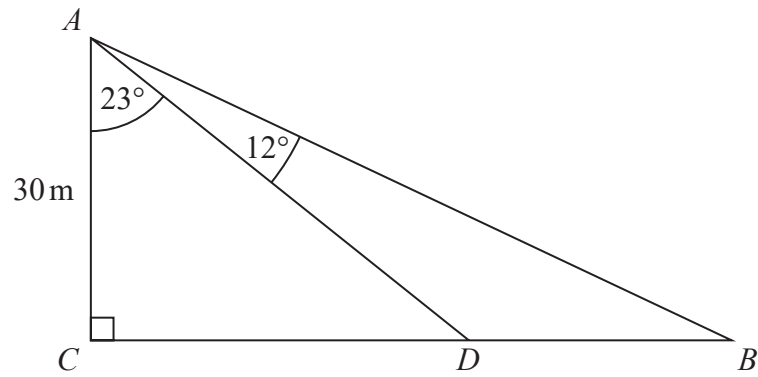
CDB is a straight line.

Calculate the length of *DB*.
Give your answer correct to 2 decimal places.

.... m

(Total for Question 9 is 4 marks)

S 6 8 5 9 1 A 0 1 0 2 4

10 A shop sells

17 different types of sandwich
15 different types of drink
26 different types of snack
14 different types of dessert.

A meal deal consists of either

a sandwich, a drink and a snack
or a sandwich, a drink and a dessert.

(a) Show that there are over 10 000 different ways to choose a meal deal.

(3)

The owner of the shop says,

"If I halve the number of snacks available, this will halve the number of ways to choose a meal deal."

The owner of the shop is incorrect.

(b) Explain why.

....

....

....

(1)

(Total for Question 10 is 4 marks)

11 (a) Expand and simplify $(x + 2)(3x - 1)(x + 4)$

....

(3)

(b) Solve $\dfrac{23 - 2y}{4} = y - 7$

$y = $ ....

(3)

(c) Solve $3p^2 - 3p - 7 = 0$

Give your solutions correct to 3 significant figures.

....

(3)

(Total for Question 11 is 9 marks)

S 6 8 5 9 1 A 0 1 3 2 4

12
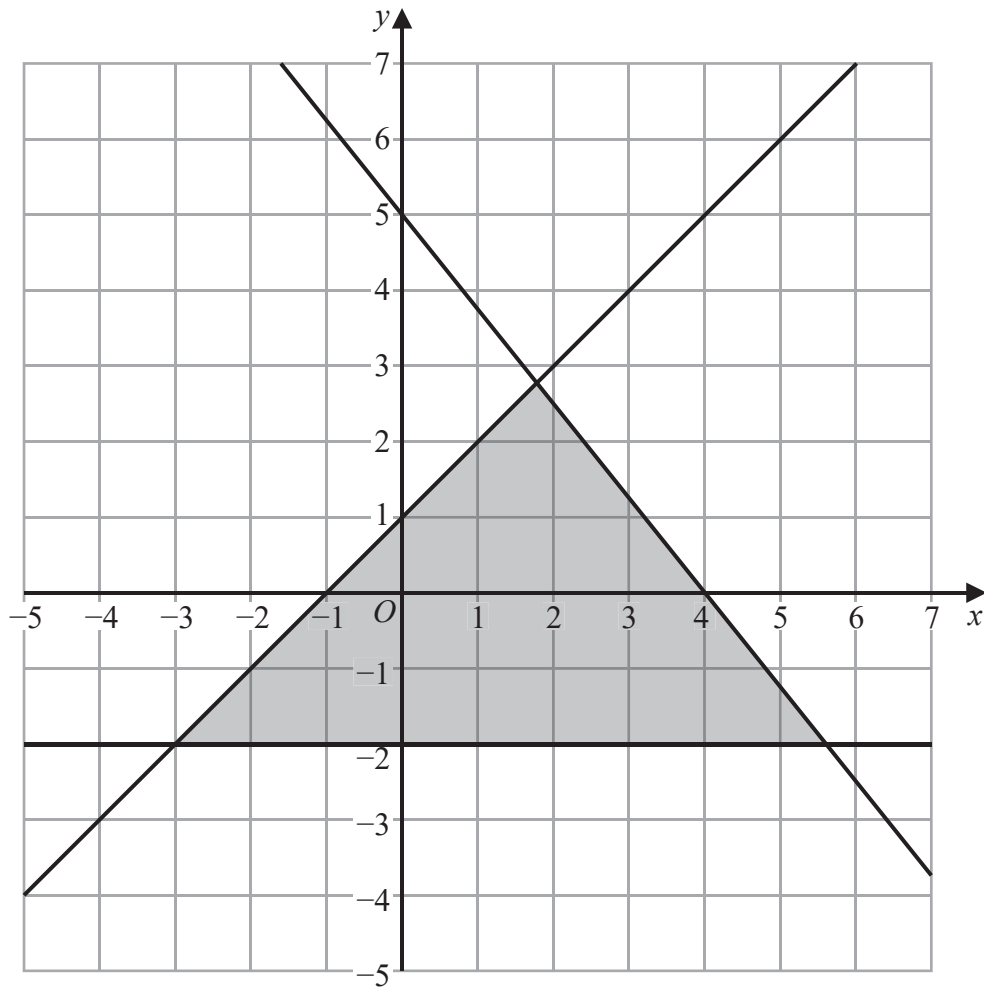
(a) Write down the inequalities that define the shaded region.

....

....

....

(3)

Natalie is asked to shade the region $y \geqslant x$ on a coordinate grid.

Here is her answer.
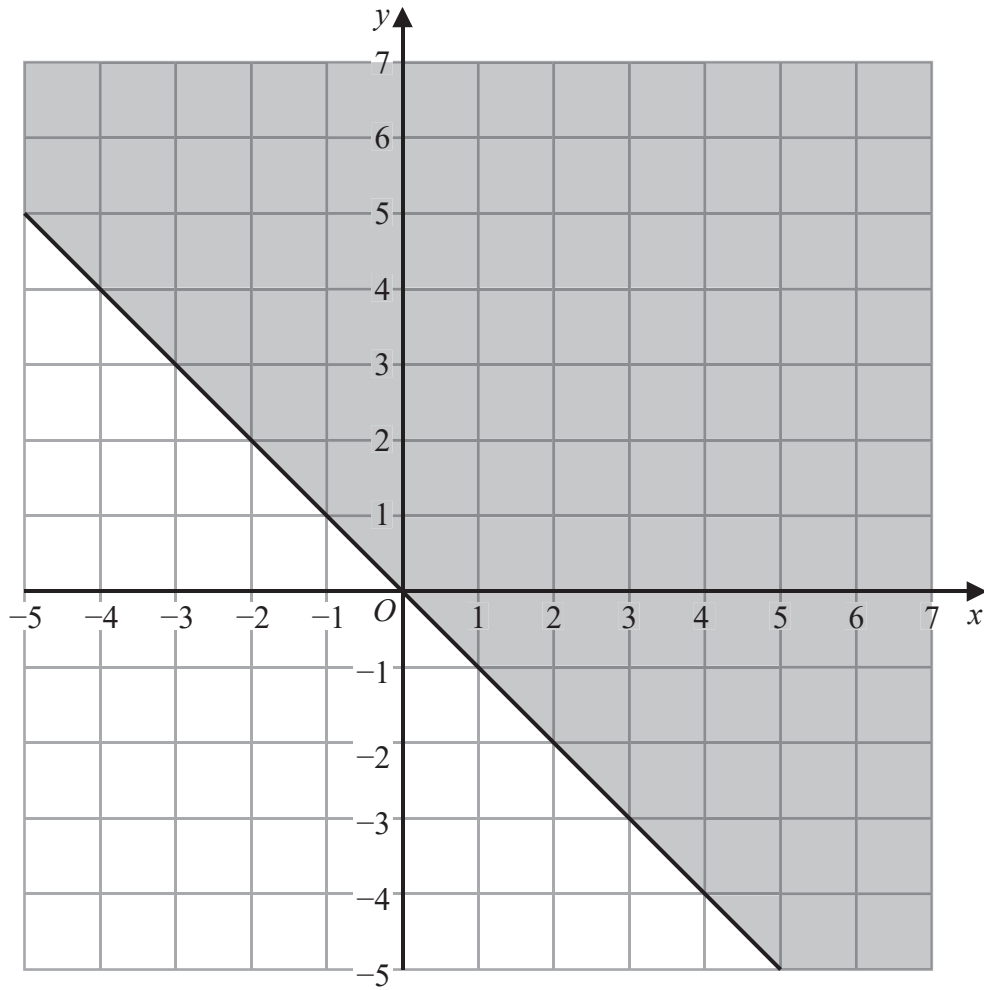
(b) What error has Natalie made?

....

....

....

(1)

(Total for Question 12 is 4 marks)

S 6 8 5 9 1 A 0 1 5 2 4

13 Solid **A** and solid **B** are similar.

The ratio of the volume of solid **A** to the volume of solid **B** is $27:1000$

The surface area of solid **A** is $810\,\text{cm}^2$

Calculate the surface area of solid **B**.

.... cm^2

(Total for Question 13 is 3 marks)

14
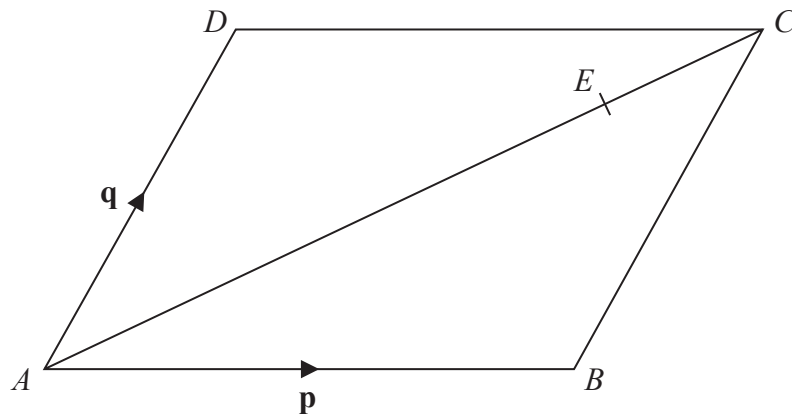
ABCD is a parallelogram.

$\overrightarrow{AB} = \mathbf{p}$

$\overrightarrow{AD} = \mathbf{q}$

The point *E* lies on *AC* such that $AE:EC = 4:1$

Find $\overrightarrow{DE}$ in terms of $\mathbf{p}$ and $\mathbf{q}$.
Give your answer in its simplest form.

....

(Total for Question 14 is 4 marks)

15 Here is a speed-time graph.
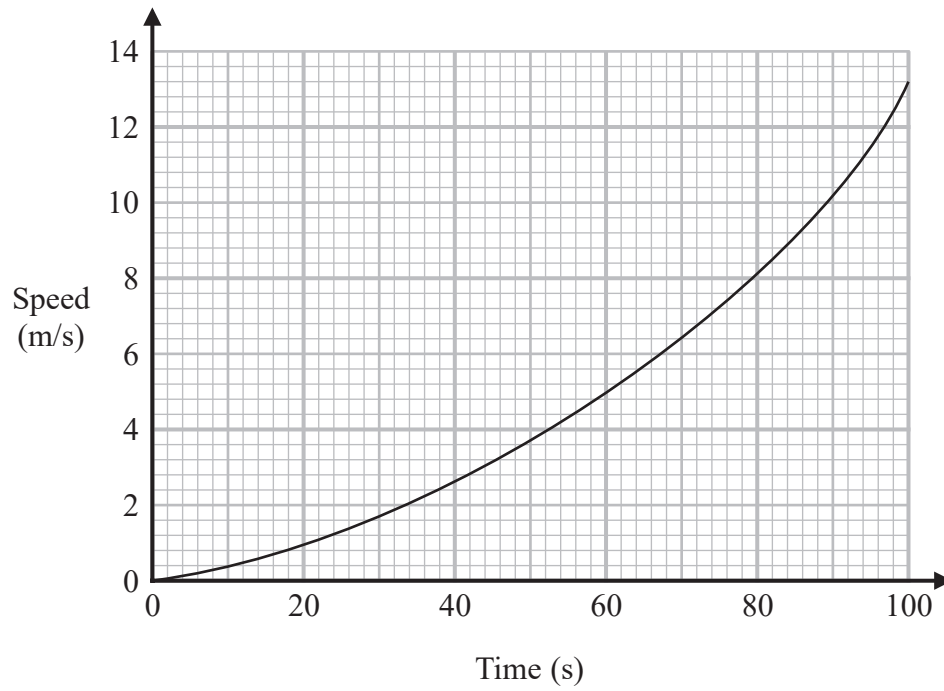
(a) Calculate an estimate of the gradient of the graph at time 50 seconds.
You must show how you get your answer.

....

(3)

(b) Describe what your answer to part (a) represents.

....

(1)

(Total for Question 15 is 4 marks)

16 Here is triangle ABC.
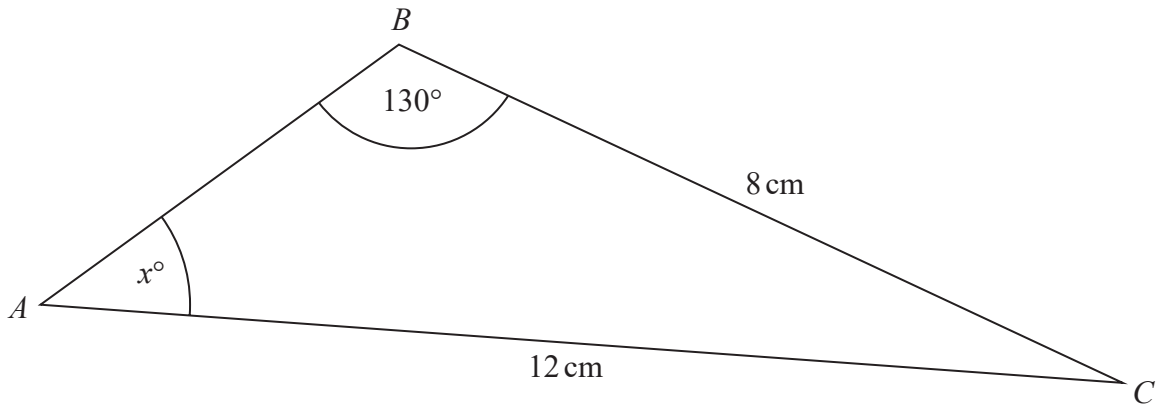
Calculate the value of x.
Give your answer correct to 3 significant figures.

....

(Total for Question 16 is 3 marks)

17 A disc is placed on horizontal ground.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The disc exerts a force of F newtons over an area of A cm² where

$F = 576.2$ correct to 1 decimal place
$A = 72$ correct to 2 significant figures.

The disc exerts a pressure of P newtons/cm² on the ground.

By considering bounds, calculate the value of P to a suitable degree of accuracy.
You must show all your working and give a reason for your answer.

....

(Total for Question 17 is 5 marks)

18 Write the expression $4x^2 + 12x + 7$ in the form $(ax + b)^2 + c$

....

(Total for Question 18 is 2 marks)

19 At the start of day n, the number of cells being used in an experiment is T_n

At the start of the next day, the number of cells being used in the experiment is T_{n+1} where

$$T_{n+1} = kT_n \text{ and } k \text{ is a positive constant.}$$

Given that

$T_1 = 250\,000$
$T_3 = 490\,000$
$T_7 : T_4 = m : 1$

find the value of m.
Give your answer correct to 3 significant figures.

....

(Total for Question 19 is 5 marks)

Turn over ▶

S 6 8 5 9 1 A 0 2 1 2 4

20 Donna found out information about the areas, in m², of some fields.

The table shows some information about her results.

Area (p m²)	Frequency
$0 < p \leqslant 10\,000$	4
$10\,000 < p \leqslant 30\,000$	16
$30\,000 < p \leqslant 60\,000$	15
$60\,000 < p \leqslant 70\,000$	
$70\,000 < p \leqslant 110\,000$	

Donna drew a histogram of her results.

The height of the bar for the class interval $70\,000 < p \leqslant 110\,000$ is twice the height of the bar for the class interval $0 < p \leqslant 10\,000$

(a) Write down the frequency for the interval $70\,000 < p \leqslant 110\,000$

....

(1)

The height of the bar for the class interval $10\,000 < p \leqslant 30\,000$ is 4 cm.

(b) Work out the height of the bar for the class interval $30\,000 < p \leqslant 60\,000$

.... cm

(2)

(Total for Question 20 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

BLANK PAGE

S 6 8 5 9 1 A 0 2 3 2 4

BLANK PAGE