

Write your name here

Surname

Other names

In the style of:

**Edexcel GCSE**

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

# Mathematics A

## Bounds

**Higher Tier**

Past Paper Style Questions  
Arranged by Topic

Paper Reference

**1MA0/2H**

**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.*
- **Calculators may be used.**



### Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed.

### Advice

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

Turn over ►

Lots more free papers at [www.bland.in](http://www.bland.in)



$$1. \quad w = \sqrt{\frac{x}{y}}$$

$x = 5.43$  correct to 2 decimal places.

$y = 4.514$  correct to 3 decimal places.

By considering bounds, work out the value of  $w$  to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

$$\text{Upper Bound of } w = \sqrt{\frac{5.435}{4.5135}} = 1.09734465\dots$$

$$\text{Lower Bound of } w = \sqrt{\frac{5.425}{4.5145}} = 1.096213239\dots$$

Upper and Lower Bounds for  $w$  are both the same when evaluated to 2 d.p. but not when evaluated to 3 d.p. This means we can be sure  $w = 1.10$  (2 d.p.). but we can't be sure if it's closer to 1.097 or 1.096 when we consider the third decimal place.

$\therefore$  2 decimal places is a suitable degree of accuracy.

$$w = 1.10 \text{ (to 2 d.p.)}$$

(Total 5 marks)



2. An arrow is shot vertically upwards at a speed of  $V$  metres per second.

The height,  $H$  metres, to which it rises is given by

$$H = \frac{V^2}{2g}$$

where  $g \text{ m/s}^2$  is the acceleration due to gravity.

$V = 24.4$  correct to 3 significant figures.

$g = 9.8$  correct to 2 significant figures.

(i) Write down the upper bound of  $g$ .

$$\underline{\underline{9.85 \text{ m/s}^2}}$$

(ii) Calculate the lower bound of  $H$ .  
Give your answer correct to 3 significant figures.

$$\frac{24.35^2}{2(9.85)} = 30.1 \text{ m (3 s.f.)}$$

$$\underline{\underline{30.1 \text{ m}}}$$

(Total 3 marks)



3. A building plot is in the shape of a rectangle.

The width of the field is 26 metres, measured to the nearest metre.(a)

Work out the upper bound of the width of the field.

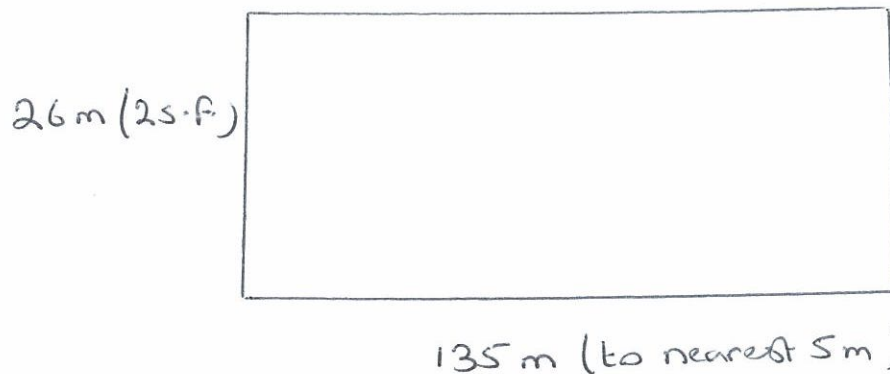
26.5 metres  
(1)

The length of the field is 135 metres, measured to the nearest 5 metres.

(b) Work out the upper bound for the perimeter of the field.

328 metres  
(3)

(Total 4 marks)



Upper Bound for length of Field = 137.5 m

$$\Rightarrow \text{Upper Bound for perimeter of Field} = 2(137.5) + 2(26.5) \\ = 328 \text{ m.}$$



4. Sophie drove for 238 miles, correct to the nearest mile.  
She used 26.3 litres of petrol, to the nearest tenth of a litre.

$$\text{Petrol consumption} = \frac{\text{Number of miles travelled}}{\text{Number of litres of petrol used}}$$

Work out the upper bound for the petrol consumption for Sophie's journey. Give your answer correct to 2 decimal places.

$$\frac{238.5}{26.25} = 9.09 \text{ miles/L (2 d.p.)}$$

..... 9.09 ..... miles per litre

(Total 3 marks)

