

Name: \_\_\_\_\_

Exam Style Questions



Limits of Accuracy

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

### Guidance

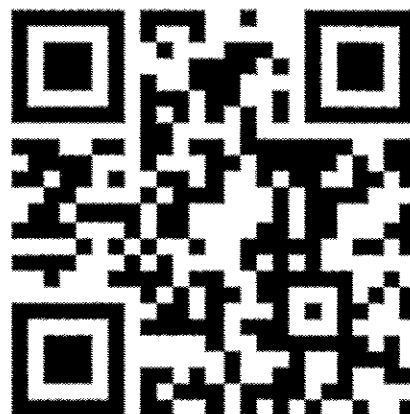
1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

[www.corbettmaths.com/contents](http://www.corbettmaths.com/contents)

Video 183

Video 184



1. A bag of apples weighs 7kg, correct to the nearest kilogram.  
What is the least possible weight of the bag of apples?



.....6.5.....kg  
(1)

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2. The length of a table is 105 cm, correct to the nearest centimetre.



- (a) Write down the smallest possible length of the table.

.....104.5.....cm  
(1)

- (b) Write down the largest possible length of the table.

.....105.5.....cm  
(1)

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3. The speed of a car is 50 mph, correct to the nearest 10 mph.



- (a) Write down the lowest possible speed of the car

.....45.....mph  
(1)

- (b) Write down the greatest possible speed of the car

.....55.....mph  
(1)

4. The distance between the Sun and Earth is 150,000,000 km, correct to 2 significant figures.



(a) Write down the lower bound

$$\begin{array}{r} 145,000,000 \\ \hline \end{array} \text{km} \quad (1)$$

(b) Write down the upper bound

$$\begin{array}{r} 155,000,000 \\ \hline \end{array} \text{km} \quad (1)$$

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5. An average clementine weighs 74g to the nearest gram.



A net contains 12 clementines.

The net weighs 20g to the nearest gram.

What is the maximum possible weight of the net of clementines.

$$\begin{array}{l} \text{Clementine} \quad \text{max} - 74.5 \\ \text{net} \quad \text{max} - 20.5 \end{array} \quad 12 \times 74.5 + 20.5$$

$$\begin{array}{r} 914.5 \\ \hline \end{array} \text{g} \quad (3)$$

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6. Find the least and greatest total length of 6 sausages, each measuring 8cm to the nearest centimetre.



$$7.5 \times 6 =$$

$$8.5 \times 6 =$$

$$\text{Least length } \dots\dots\dots 45 \dots\dots\dots \text{cm}$$

$$\text{Greatest length } \dots\dots\dots 51 \dots\dots\dots \text{cm} \quad (2)$$

7. A rectangular rugby pitch has width 74 metres, measured to the nearest metre.



(a) Write down the upper bound of the width of the pitch.

$$\begin{array}{r} 74.5 \\ \hline \end{array} \text{m} \quad (1)$$

The length of the pitch is 115 metres, measured to the nearest 5 metres.

(b) Work out the upper bound for the perimeter of the pitch

$$\begin{array}{l} \text{length } 117.5 \\ 74.5 + 74.5 + 117.5 + 117.5 = \\ \hline 384 \end{array} \text{m} \quad (3)$$

8. Anthony measured the length and width of a rectangle.



He measured the length to be 18cm correct to the nearest centimetre.

He measured the width to be 10cm correct to the nearest 10 centimetres.

Calculate the lower bound for the area of this rectangle.

$$17.5 \times 5 =$$

$$\begin{array}{r} 87.5 \\ \hline \end{array} \text{cm}^2 \quad (2)$$

9. A circular mirror has a diameter of 60cm to the nearest centimetre.



Find the greatest possible area of the mirror.

Give your answer in  $\text{cm}^2$

$$\begin{array}{l} \text{diameter } 60.5 \\ \text{radius } 30.25 \\ \pi \times 30.25^2 \end{array}$$

$$\begin{array}{r} 2874.754 \\ \hline \end{array} \text{cm}^2 \quad (3)$$

10. The heights of 6 plants are listed below.  
Each height is given to one decimal place.



4.55	7.25	8.15	9.65	9.15	3.15
4.5cm	7.2cm	8.1cm	9.6cm	9.1cm	3.1cm
4.45	7.15	8.05	9.55	9.05	3.05

- (a) Work out the smallest possible mean.

$$\frac{41.3}{6}$$

$$\frac{6.883\ldots}{\text{.....cm}}$$

(2)

- (b) Work out the greatest possible range.

$$\frac{41.9}{6}$$

$$\frac{6.983\ldots}{\text{.....cm}}$$

(2)

11. The width of a rectangle is 50cm, correct to 2 significant figures.  
The length of a rectangle is 115cm, correct to 3 significant figures.



- (a) Write down the lower bound for the width.

$$\frac{49.5}{\text{.....cm}}$$

(1)

- (b) Calculate the lower bound for the area of the rectangle.

$$49.5 \times 114.5$$

$$\frac{5667.75}{\text{.....cm}^2}$$

(2)

12. Declan ran a distance of 200m in a time of 26.2 seconds.



The distance of 200m was measured to the nearest 10 metres.  
The time of 26.2 was measured to the nearest tenth of a second.

(a) Work out the upper bound for Declan's average speed.

$$s = \frac{d}{t}$$
$$\text{Max } s = \frac{\text{max } d}{\text{min } t} = \frac{205}{26.15} = 7.839 \dots \text{m/s}$$

(2)

(b) Work out the lower bound for Declan's average speed.

$$\text{min } s = \frac{\text{min } d}{\text{max } t} = \frac{195}{26.25} = 7.429 \dots \text{m/s}$$

(2)

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13. A circle has an area of 120cm<sup>2</sup> to the nearest 10cm<sup>2</sup>.



Work out the upper bound of the radius

$$\text{Max Area} = 125$$

$$\pi r^2 = 125$$

$$r^2 = \frac{125}{\pi}$$

$$r = \sqrt{\frac{125}{\pi}} = 6.3078 \dots$$

.....cm  
(3)

14. Sophie estimated that the distance between Bristol and Newcastle is about 290 miles and that her average driving speed would be 60 mph.



She estimated the distance to the nearest 10 miles and the speed to the nearest 10 mph.

Calculate the lower bound of the time the journey should take.  
Give your answer in hours and minutes.  
Give your answer to the nearest minute.

quickest  $\rightarrow t = \frac{d}{s}$    
 $\leftarrow \text{min}$    
 $\leftarrow \text{max}$

$$t = \frac{285}{65} = 4.384615$$

$$0.384615 \times 60 = 23.076..$$

4 .....hours 23 .....minutes  
(4)

15. The final velocity of a traveling object is given by the formula



$$v = u + at$$

where  $v$  is the final velocity  
 $u$  is the initial velocity  
 $a$  is the acceleration  
and  $t$  is the time

Given  $u = 2.4$  m/s correct to 2 significant figures,  $2.35$   
 $a = 12$  m/s<sup>2</sup> correct to 2 significant figures,  $11.5$   
 and  $t = 5$  seconds correct to 1 significant figure.  $4.5$

Calculate the lower bound for  $v$ .

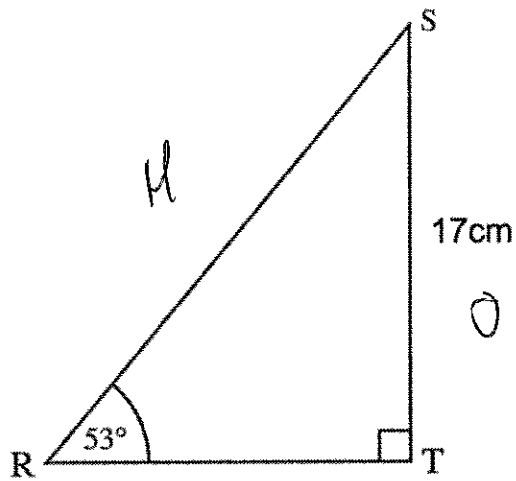
$$v = 2.35 + 11.5 \times 4.5$$

54.1 .....m/s  
(4)





17. Shown below is triangle RST.  
 Angle SRT is  $53^\circ$ , to the nearest degree.  
 ST is 17cm to the nearest centimetre.



Work out the upper bound for the length of RS.

$$5^\circ H$$

$$RS = \frac{0 \leftarrow \text{max}}{\sin \alpha \leftarrow \text{min}}$$

$$RS = \frac{17.5}{\sin 52.5} =$$

$$\underline{\underline{22.058}} \text{ cm}$$

(4)

18. The length of the base of a triangle is 10cm, correct to 2 significant figures.  
The length of the perpendicular height of a triangle is 15cm, correct to 2 significant figures.



(a) Calculate the upper bound for the area of the triangle

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \times 10.5 \times 15.5$$

=

$$\begin{array}{r} 81.375 \\ \hline \text{.....cm}^2 \\ (2) \end{array}$$

(b) Calculate the lower bound for the area of the triangle

$$A = \frac{1}{2} \times 9.95 \times 14.5$$

=

$$\begin{array}{r} 72.1375 \\ \hline \text{.....cm}^2 \\ (2) \end{array}$$