1 The length of a book is 33.8 cm, correct to one decimal place.

(a) Write down the lower bound of the length of the book.

..... cm

(1)

(b) Write down the upper bound of the length of the book.

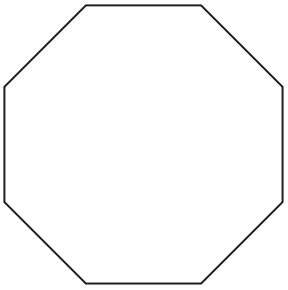
..... cm

(1)

(Total for Question 1 is 2 marks)

---

2 Each side of a regular octagon has a length of 18 mm, correct to the nearest 0.5 mm



(a) Write down the lower bound of the length of each side of the octagon.

..... mm

(1)

(b) Write down the upper bound of the length of each side of the octagon.

..... mm

(1)

(Total for Question 2 is 2 marks)

3 The weight of a cat is 4.3 kg correct to 2 significant figures.

(a) Write down the upper bound of the weight of the cat.

..... kg

(1)

(b) Write down the lower bound of the weight of the cat.

..... kg

(1)

$G = e - f$

$e = 17$ correct to the nearest integer
$f = 9.4$ correct to one decimal place

(c) Work out the upper bound for the value of G.

.....

(2)

(Total for Question 3 is 4 marks)

4 $C = b - a$

$a =$ 6 correct to the nearest integer
$b =$ 15 correct to the nearest 5

Work out the upper bound for the value of C
Show your working clearly.

.....

(Total for Question 4 is 3 marks)

5

$$a = \frac{v - u}{t}$$

$v = 9.6$ correct to 1 decimal place
$u = 3.8$ correct to 1 decimal place
$t = 1.84$ correct to 2 decimal places

Calculate the upper bound for the value of a.
Give your answer as a decimal correct to 2 decimal places.
Show your working clearly.

.....

(Total for Question 5 is 3 marks)

6 $P = \dfrac{2a - c}{d}$

$a = 58.4$ correct to 3 significant figures.
$c = 20$ correct to 2 significant figures.
$d = 3.6$ correct to 2 significant figures.

Work out the upper bound for the value of P.
Show your working clearly.
Give your answer correct to 2 decimal places.

.....

(Total for Question 6 is 3 marks)

7 $P = ef$

$e = 4.8$ correct to 2 significant figures.
$f = 0.26$ correct to 2 significant figures.

(a) Work out the lower bound for the value of P.
Show your working clearly.
Give your answer correct to 3 significant figures.

(2)

$$Q = \frac{t}{w}$$

$t = 2.73$ correct to 3 significant figures.
$w = 0.04$ correct to 1 significant figure.

(b) Work out the upper bound for the value of Q.
Show your working clearly.
Give your answer correct to 2 significant figures.

(2)

(Total for Question 7 is 4 marks)

8

$$A = w - \frac{x^2}{y}$$

$w = 3.45$ correct to 2 decimal places.
$x = 1.9$ correct to 1 decimal place.
$y = 5$ correct to the nearest whole number.

Work out the lower bound of the value of A
Show your working clearly.

.....

(Total for Question 8 is 3 marks)

9 $X = \dfrac{2a - b}{f}$

$a = 7.5$ correct to 1 decimal place.
$b = 3.42$ correct to 2 decimal places.
$f = 2$ correct to the nearest whole number.

Work out the upper bound of the value of X
Show your working clearly.

.....

(Total for Question 9 is 3 marks)

10 $P = \dfrac{a}{m - x}$

$x = 8$ correct to 1 significant figure
$a = 4.6$ correct to 2 significant figures
$m = 20$ correct to the nearest 10

Calculate the lower bound of P.
Show your working clearly.

(Total for Question 10 is 4 marks)

11

$$k = \frac{t}{a - h}$$

t = 14 correct to 2 significant figures
a = 7.8 correct to 2 significant figures
h = 3.4 correct to 2 significant figures

Work out the lower bound for the value of k.
Show your working clearly.

.....

(Total for Question 11 is 3 marks)

12

$$a = \frac{p - q}{t}$$

$p = 8.4$ correct to 2 significant figures.
$q = 6.3$ correct to 2 significant figures.
$t = 0.27$ correct to 2 significant figures.

Work out the upper bound for the value of a.
Show your working clearly.
Give your answer correct to 1 decimal place.

.....

(Total for Question 12 is 3 marks)

13

$$P = \frac{t - w}{y}$$

t = 9.7 correct to 1 decimal place

w = 5.9 correct to 1 decimal place

y = 3 correct to 1 significant figure

Calculate the upper bound for the value of P.
Show your working clearly.

.....

(Total for Question 13 is 3 marks)

14

$$x = \frac{6a}{b - a}$$

a = 3.46 correct to 3 significant figures.
b = 6.3 correct to 1 decimal place.

Work out the upper bound for the value of x.
Give your answer as a decimal correct to 3 significant figures.
Show your working clearly.

.....

(Total for Question 14 is 3 marks)

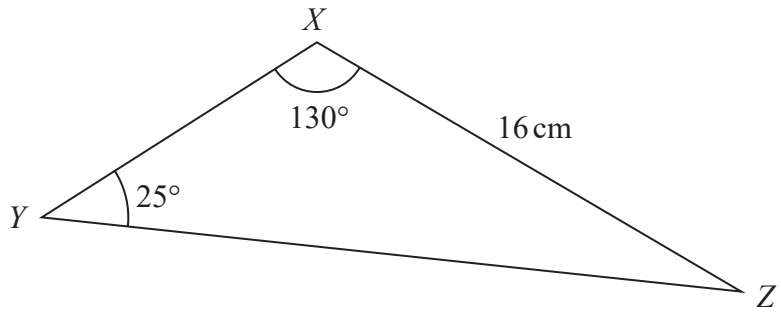
15 A metal block has a mass of 5 kg, correct to the nearest 50 grams.
The block has a volume of $(1.84 \times 10^{-3})\,m^3$, correct to 3 significant figures.

Work out the upper bound for the density of the block.
Give your answer in kg/m^3 correct to 1 decimal place.
Show your working clearly.

..... kg/m^3

(Total for Question 15 is 4 marks)

16 Here is a triangle *XYZ*.



The length *XZ* and the angles *YXZ* and *XYZ* are each given correct to 2 significant figures.

Calculate the upper bound for the length *YZ*.
Give your answer correct to one decimal place.
Show your working clearly.

..... cm

(Total for Question 16 is 3 marks)

17 Kaidan and Sonja went on two different car journeys.

For Kaidan's journey
distance = 80 km correct to the nearest 5 km
time = 2.7 hours correct to 1 decimal place

For Sonja's journey
distance = 33 km correct to 2 significant figures
time = 1 hour correct to the nearest 0.1 hour

Kaidan says,
"My average speed could have been greater than Sonja's average speed."

By considering bounds, show that Kaidan is correct.
Show your working clearly.

(Total for Question 17 is 4 marks)

18 Ebony makes some bracelets to sell.

The materials to make all the bracelets cost £190, correct to the nearest £5
Ebony sells all the bracelets for a total of £875, correct to the nearest £5

The total time taken to make and sell all these bracelets was 72 hours, correct to the nearest hour.

Ebony uses this method to calculate her hourly rate of pay

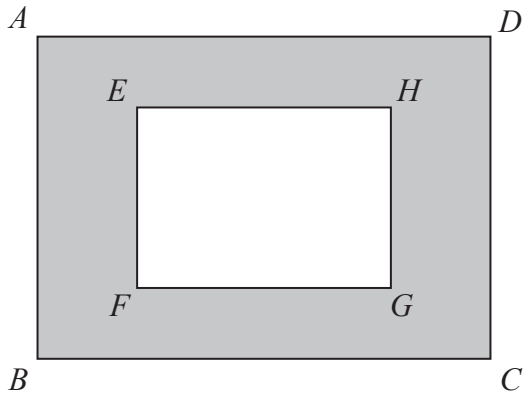
$$\text{Hourly rate of pay} = \frac{\text{total selling price} - \text{total cost of materials}}{\text{total time taken}}$$

The minimum hourly rate of pay for someone of Ebony's age is £8.20

By considering bounds, determine if Ebony's hourly rate of pay was definitely more than £8.20
You must show all your working.

(Total for Question 18 is 4 marks)

19 The diagram shows rectangle *ABCD* with rectangle *EFGH* cut out to form the shaded region.



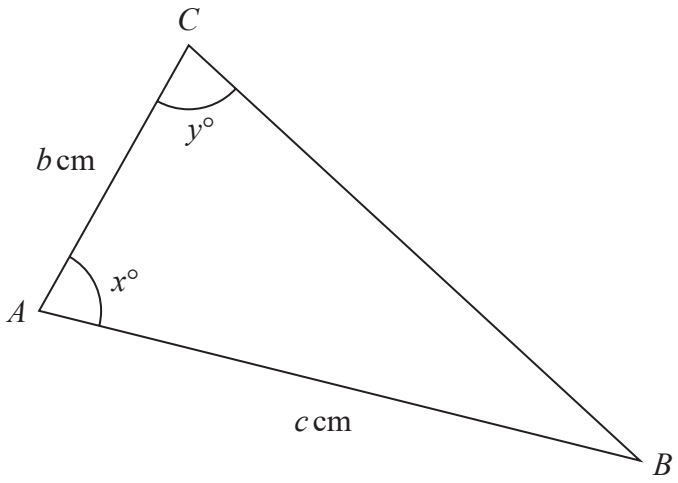
AD = 8.3 cm correct to one decimal place
DC = 7.2 cm correct to one decimal place
EH = 6.2 cm correct to one decimal place
HG = 5.3 cm correct to one decimal place

Work out the upper bound of the area of the shaded region.
Show your working clearly.

..... cm^2

(Total for Question 19 is 3 marks)

20 The diagram shows triangle ABC



$c = 11.5$ correct to one decimal place
$x = 80$ correct to the nearest whole number
$y = 75$ correct to the nearest whole number

Calculate the upper bound for the value of b
Show your working clearly.
Give your answer correct to 3 significant figures.

.....

(Total for Question 20 is 4 marks)