

Name: _____

Upper and Lower Bounds

Date:

Time:

Total marks available:

Total marks achieved: _____

Questions

Q1.

Sasha drops a ball from a height of d metres onto the ground.

The time, t seconds, that the ball takes to reach the ground is given by

$$t = \sqrt{\frac{2d}{g}}$$

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

$d = 35.6$ correct to 3 significant figures.

$g = 9.8$ correct to 2 significant figures.

(a) Write down the lower bound of d .

.....

(1)

(b) Calculate the lower bound of t .
You must show all your working.

.....

(3)

(Total for Question is 4 marks)

Q2.

Jarek uses the formula

$$\text{Area} = \frac{1}{2} ab \sin C$$

to work out the area of a triangle.

For this triangle,

$a = 7.8$ cm correct to the nearest mm.

$b = 5.2$ cm correct to the nearest mm.

$C = 63^\circ$ correct to the nearest degree.

Calculate the lower bound for the area of the triangle.

..... cm²

(Total for question = 3 marks)

Q3.

$$I = \frac{V}{R}$$

$V = 250$ correct to the nearest 5

$R = 3900$ correct to the nearest 100

Work out the lower bound for the value of I .

Give your answer correct to 3 decimal places.

You must show your working.

.....

(Total for question = 3 marks)

Q4.

$a = 40$ correct to 1 significant figure.

$b = 0.2$ correct to 1 significant figure.

Calculate the upper bound of $\frac{a}{b}$

.....

(Total for question = 3 marks)

Q5.

Steve travelled from Ashton to Barnfield.

He travelled 235 miles, correct to the nearest 5 miles.

The journey took him 200 minutes, correct to the nearest 5 minutes.

Calculate the lower bound for the average speed of the journey.

Give your answer in **miles per hour**, correct to 3 significant figures.

You must show all your working.

..... mph

(Total for question = 4 marks)

Q6.

The value of p is 4.3

The value of q is 0.4

Both p and q are given correct to the nearest 0.1

(a) Write down the lower bound for p .

.....

(1)

$$r = p + \frac{1}{q}$$

(b) Work out the upper bound for r .

You must show all your working.

.....

(3)

(Total for question = 4 marks)

Q7.

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

$v = 37.6$ correct to 3 significant figures.

$u = 11.3$ correct to 3 significant figures.

$t = 8.4$ correct to 2 significant figures.

Work out the upper bound for the value of a .

Show your working clearly.

.....

(Total for question = 3 marks)