Bounds

GCSE Worksheet

Written & Designed by
Adithya Arangan

1. State the upper and lower bounds of:

a) 150cm measured to the nearest 10 cm

Upper: .....

Lower: ..... (2)

b) 250g measured to the nearest 10g

Upper: .....

Lower: ..... (2)

c) 3.6m measured to the nearest 0.1m

Upper: .....

Lower: ..... (2)

d) 7.8Kg measured to the nearest 0.1kg.

Upper: .....

Lower: ..... (2)

e) 1200 ml measured to the nearest 100ml.

Upper: .....

Lower: ..... (2)

2. John's room is 10m wide, rounded to one significant figure. What are the upper and lower bounds?

Upper: .....

Lower: ..... (2)

3. The following values of x have been rounded to the nearest 100. Express the range of values of x before rounding as an inequality.

a) 300

..... (2)

b) 1200

..... (2)

c) 4500

..... (2)

d) 9800

..... (2)

e) 76500

..... (2)

4. A square has side lengths of 5cm, rounded to the nearest whole number. Calculate the upper bound of the area of the square.

..... (2)

5. A triangle has a height of 50cm and base of 90cm, both rounded to the nearest 10cm. Calculate the lower bound for the area of the triangle.

..... (3)

6. 20 cubes each have a side length of 15cm, rounded to the nearest whole number. Calculate the minimum volume of a box needed to pack all the cubes.

..... (3)

7. Will has three sofas of lengths 209cm, 187cm and 132cm, rounded to the nearest centimeter. He needs to place these along a wall of 526.2cm. Can this even be possible? Explain your answer.

.....

.....

..... (3)

8. A car travels 40km in 0.3h, rounded to the nearest 0.1h. Calculate the lower bound of the average speed. Give your answer to the 3 significant figures.

..... (3)

9. A marble has a density of 3g/cm^3, rounded to the nearest whole number.

Lua has a bag of 20 marbles, each of which has a volume of 2cm^3, rounded to the nearest whole number.

The bag weighs 5.6g, rounded to 1 decimal place. Calculate the maximum mass of the bag.

..... (4)

10. The acceleration of a car is given by:

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

$v = 9.5$m/s, rounded to 1 decimal place
$u = 7.84$m/s, rounded to 2 decimal places
$t = 3$s, rounded to the nearest whole number

Calculate the upper bound of the car's acceleration. Give your answer to 1d.p.

..... m/s^2 (4)

11. The displacement of a plane is given by: $s = ut + \frac{1}{2}at^2$

$u = 3.5$m/s, rounded to 1 decimal place
$t = 4$s, rounded to the nearest whole number
$a = 9.81$m/s^2, rounded to 2 decimal places

Calculate the lower bound of the plane's displacement. Give your answer to 2.d.p.

..... m (3)

12. $$k = \frac{2v - 3m^2}{\sqrt{(2s)}}$$

$v = 6.9$, rounded to 1 decimal place
$m = 70$, rounded to the nearest 10
$s = 150$, rounded to 2 significant figures

Calculate the upper bound of k. Give your answer to 3 significant figures.

..... (4)

13. $$n = \frac{m^2 + 4v}{3k}$$

$m = 4.5$, rounded to 1 decimal place
$v = 20.1$, rounded to 1 decimal place
$k = 7.54$, rounded to 2 decimal places

By considering bounds, work out the value of n to a suitable degree of accuracy.
Give a reason for your answer.

n = ...

.....

..... (5)