1 Write down the lower and upper bounds of each of these values, rounded to the accuracy stated.

a 8 m (1 significant figure) **b** 26 kg (2 significant figures) **c** 25 min (2 significant figures)

d 85 g (2 significant figures) **e** 2.40 m (2 decimal places) **f** 0.2 kg (1 decimal place)

g 0.06 s (2 decimal places) **h** 300 g (1 significant figure) **i** 0.7 m (1 decimal place)

j 366 d (3 significant figures) **k** 170 weeks (2 significant figures) **l** 210 g (2 significant figures)

2 Billy has 40 identical marbles. Each marble weighs 65 g (to the nearest gram).

a What is the greatest possible weight of one marble?

b What is the least possible weight of one marble?

c What is the greatest possible weight of all the marbles?

d What is the least possible weight of all the marbles?

3. A field is in the shape of a rectangle.

The length of the field is 340 m, to the nearest metre.
The width of the field is 117 m, to the nearest metre.

Calculate the upper bound for the perimeter of the field.

$339.5 < L < 340.5$

$116.5 < W < 117.5$

Upper Bound for Perimeter

$340.5 + 117.5 + 340.5 + 117.5$

916 ..... m

(Total 2 marks)

4. The length of a rectangle is 30 cm, correct to 2 significant figures.
The width of a rectangle is 18 cm, correct to 2 significant figures.

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

(1)

18.5 ..... cm

(b) Calculate the upper bound for the area of the rectangle.

(2)

$29.5 < L < 30.5$

$17.5 < W < 18.5$

30.5×18.5

$= 564.25$

$= 560$ to 2 s.f

560 ..... cm

(Total 3 marks)

9. The voltage V of an electronic circuit is given by the formula

$$V = I R$$

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

where I is the current in amps
and R is the resistance in ohms.

Given that $V = 218$ correct to 3 significant figures,
$R = 12.6$ correct to 3 significant figures,

calculate the lower bound of I.

Lower Bound for $I = \frac{V_{min}}{R_{max}}$

$= \frac{217.5}{12.65} = 17.194$

$= 17.2$ amps to 3 s.f.

***10.** $m = \dfrac{\sqrt{s}}{t}$

$s = 3.47$ correct to 2 decimal places.
$t = 8.132$ correct to 3 decimal places.

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

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

$3.465 \leq s < 3.475$

$8.1315 \leq t < 8.1325$

$\frac{\sqrt{3.465}}{8.1325} < m < \frac{\sqrt{3.475}}{8.1315}$

$0.2289 \quad m < 0.2292$

$m = 0.229$ to 3 s.f