GCSE HIGHER · REVISION MAT 3

Upper and lower bounds

1 A time is 4.6 s to 1 decimal place.

Write down its bounds.

2 $x = 12$ to 2 s.f. and $y = 3$ to the nearest whole number.

Find the upper bound of xy.

3 Ben says the upper bound of 250, to the nearest 50, is 255.

Explain his mistake.

4 A circle has radius 5 cm to the nearest cm.

Find the upper bound of its circumference, to 1 d.p.

5 8 and 3 are each correct to the nearest whole number.

Show that the lower bound of 8 – 3 is 4.

6 Pressure = force ÷ area.

Force = 120 N (nearest 10 N).

Area = 0.8 m² (1 d.p.).

Find the upper bound of the pressure.

7 A rope is 20 m to the nearest m.

It is cut into pieces of 1.5 m, to 1 d.p.

Show that at least 12 pieces can always be cut.

8 $v = \sqrt{2gh}$, where $g = 9.8$ (1 d.p.) and $h = 15$ (nearest m).

Find v to a suitable degree of accuracy.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

Upper and lower bounds

1 **4.55 s and 4.65 s**

2 12.5 × 3.5

43.75

3 Half of 50 is 25.

Upper bound is 275.

4 2π × 5.5

34.6 cm

5 7.5 – 3.5

= 4

6 $\frac{125}{0.75}$

166.7 N/m²

7 Worst case: $\frac{19.5}{1.55}$ = 12.58...

So at least 12 full pieces

8 UB: $\sqrt{2 \times 9.85 \times 15.5}$ = 17.47

LB: $\sqrt{2 \times 9.75 \times 14.5}$ = 16.82

Both round to 17, so *v* = 17 m/s (2 s.f.)

Mr&Mrs MATHS