Suitable Degree of Accuracy

(a) The width of a rectangle is 1.86 cm to 2 decimal places. The length of the rectangle is 4.63 cm to 2 decimal places. By considering bounds, find the area of the rectangle to a suitable degree of accuracy.

(b) A car travels 75 km to 2 significant figures. The time taken to travel this distance is 1.23 hours, correct to 2 decimal places. By considering bounds, find the speed of the car in km/h to a suitable degree of accuracy.

(a) LB = $1.855 \times 4.625 = 8.579\ldots$

UB = $1.865 \times 4.635 = 8.644\ldots$

8.6 (1dp)

(b) LB = $\frac{74.5}{1.235} = 60.324\ldots$

UB = $\frac{75.5}{1.225} = 61.633\ldots$

60 (1sf)

(a) $d = \sqrt{\frac{b}{c}}$

$b = 5.63$ correct to 2 decimal places

$c = 1.78$ correct to 2 decimal places

By considering bounds, find d to a suitable degree of accuracy.

(b) $t = 0.15u^2v$

$u = 7.6$ correct to 2 significant figures

$v = 12.4$ correct to 3 significant figures

By considering bounds, find t to a suitable degree of accuracy.

(c) $y = c(d - e)$

$c = 3.9$ correct to 1 decimal place.

$d = 18.3$ correct to 3 significant figures

$e = 3.26$ correct to 2 decimal places

By considering bounds, find y to a suitable degree of accuracy.

(a) LB = $\sqrt{\frac{5.625}{1.785}} = 1.775\ldots$

UB = $\sqrt{\frac{5.635}{1.775}} = 1.782\ldots$

1.78 (2dp)

(b) LB = $0.15 \times 7.55^2 \times 12.35 = 105.597$

UB = $0.15 \times 7.65^2 \times 12.45 = 109.291$

110 (2sf)

(c) LB = $3.85(18.25 - 3.265) = 57.692\ldots$

UB = $3.95(18.35 - 3.255) = 59.625\ldots$

60 (2sf)

(a) A cube has dimensions 8.29 cm by 6.51 cm by 2.89 cm, all measured correct to 2 decimal places. The mass of the cube is 562 g correct to the nearest gram. By considering bounds, find the density of the cube in g/cm^3 to a suitable level of accuracy.

(b) A sector of a circle has an angle of $78.2°$ correct to the nearest tenth of a degree and a radius of 12.8 cm correct to 3 significant figures. By considering bounds, find the area of the sector to a suitable degree of accuracy.

(a) LB = $\frac{561.5}{8.295 \times 6.515 \times 2.895} = 3.589\ldots$

UB = $\frac{562.5}{8.285 \times 6.505 \times 2.885} = 3.618\ldots$

3.6 (1dp)

(b) LB = $\frac{78.15}{360} \times \pi \times 12.75^2 = 110.866\ldots$

UB = $\frac{78.25}{360} \times \pi \times 12.85^2 = 112.8756$

110 (2sf)