

Chapter 2 Solution

Exercise 2

1. (a) 2.8125 A1 N1 [1]
- (b) 2.81 A1 N1 [1]
- (c) $2.805 \leq B < 2.815$ A2 N2 [2]
- (d) The percentage error
$$= \left| \frac{2.84 - 2.8125}{2.8125} \right| \times 100\%$$
$$= 0.977777778\%$$
$$= 0.978\%$$
 (A1) for correct substitution A1 N2 [2]
2. (a) The perimeter
$$= 5.278 + 4.812 + 4.118 + 3.756$$
$$= 17.964 \text{ cm}$$
 (M1) for valid approach A1 N2 [2]
- (b) The upper bound is 5.35 cm.
The lower bound is 5.25 cm. A1 N1 A1 N1 [2]
- (c) The percentage error
$$= \left| \frac{(5.3 + 4.8 + 4.1 + 3.8) - 17.964}{17.964} \right| \times 100\%$$
$$= 0.200400801\%$$
$$= 0.200\%$$
 (A1) for correct substitution A1 N2 [2]

3. (a) The volume
 $= (15.75)(8.95)(7.15)$ (M1) for valid approach
 $= 1007.881875 \text{ cm}^3$ A1 N2 [2]
- (b) The upper bound is 7.5 cm. A1 N1
The lower bound is 6.5 cm. A1 N1 [2]
- (c) The percentage error
 $= \left| \frac{(16)(9)(7) - 1007.881875}{1007.881875} \right| \times 100\%$ (A1) for correct substitution
 $= 0.011720123\%$
 $= 0.0117\%$ A1 N2 [2]
4. (a) $L = \sqrt{39.063125^2 - 10.937675^2}$ (M1) for valid approach
 $L = 37.5006 \text{ km}$ A1 N2 [2]
- (b) $37.495 \text{ km} \leq L < 37.505 \text{ km}$ A2 N2 [2]
- (c) The percentage error
 $= \left| \frac{\frac{(37.50)(10.94)}{2} - \frac{(37.5006)(10.937675)}{2}}{\frac{(37.5006)(10.937675)}{2}} \right| \times 100\%$ (A1) for correct substitution
 $= 0.019656488\%$
 $= 0.0197\%$ A1 N2 [2]