Interpreting precision and reasonable answers

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. A cylinder has radius 4 cm and height 5 cm. Give its volume to one decimal place. [2 marks]

$V = \pi(4^2)(5) = 80\pi \approx 251.327$ cm³, giving 251.3 cm³.

Answer: 251.3 cm³

2. A calculated length is $\sqrt{50}$ m. Round it to two decimal places. [2 marks]

$\sqrt{50} = 7.071067\ldots$, so the answer is 7.07 m.

Answer: 7.07 m

3. A square has a stated side length of 2.35 m. Calculate its perimeter. [2 marks]

$P = 4(2.35) = 9.40$ m, written as 9.4 m.

Answer: 9.4 m

4. A rectangular plot is 6.8 m by 4.2 m. Give its area to one decimal place. [2 marks]

$6.8 \times 4.2 = 28.56$ m², which rounds to 28.6 m².

Answer: 28.6 m²

5. A height is recorded as 1.20 m to the nearest 0.01 m. State the maximum rounding error in metres. [2 marks]

The recording step is 0.01 m. Its half-step is 0.005 m.

Answer: 0.005 m

6. A student uses $\sqrt{2} \approx 1.4$ to calculate $10\sqrt{2}$ and reports 14.0 cm. Find the correct answer to one decimal place and explain the difference. [3 marks]

$10\sqrt{2} = 14.142\ldots$ cm. Rounding only at the end gives 14.1 cm.

Answer: 14.1 cm; the square root was rounded too early.