Evaluating assumptions and suitable precision

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Cable is sold in 2 m lengths. A job needs 7.1 m. Find the minimum number of lengths. [2 marks]

7.1/2=3.55, so buy 4.

Answer: 4

2. A closed cubic container has outside edge 12 cm. Its base, lid and four side walls are each 1 cm thick. Find its capacity in cm^3. [2 marks]

Internal edge 10 cm.

$10^3=1000$.

Answer: 1000 cm^3

3. Lengths measured to 0.1 m give a calculated area 17.382946 m^2. Explain a limitation of reporting every digit. [3 marks]

The input measurements already have rounding uncertainty.

Report suitable rounding and state assumptions.

Answer: The digits imply unsupported precision.

4. Soil is delivered in 0.5 m³ units. A garden needs 3.6 m³. Find the minimum order and excess. [2 marks]

Buy 8 units rather than 7.2.

8×0.5=4.0.

Answer: 4.0 m³; 0.4 m³ excess

5. A cylinder is filled to 90% of its internal height. What factor adjusts full capacity? [2 marks]

For fixed radius, volume is proportional to height.

Answer: 0.9

6. A continuous-area model costs material at 19.80 dollars. Two whole sheets priced 12 dollars each are required. State actual purchase cost and explain. [3 marks]

Two sheets cost 2×12=24.

The continuous model ignored whole-sheet constraints.

Answer: 24 dollars