Marking guide | Measurement and scale

Measurement and scale - Practice test 2

16 questions | 37 marks | 55 minutes

Composite solids, scale factors and reliable measurement.

Equivalent correct methods earn the corresponding marks.

1. Find volume of a 5 by 4 by 3 cm cuboid. [1 mark]

$5 \times 4 \times 3 = 60$.

Answer: 60 cm³

2. A real 6 m length is drawn as 12 cm. Find scale. [2 marks]

Drawing:real $= 12$ cm $: 600$ cm $= 1 : 50$.

Answer: $1 : 50$

3. A similar enlargement has length factor 4. State its area factor. [1 mark]

$4^2 = 16$.

Answer: 16

4. A 7.20 kg measurement is to 0.01 kg. Give maximum rounding error. [2 marks]

Half of 0.01 kg.

Answer: 0.005 kg

5. A 4 by 3 by 2 cm cuboid joins a 5 by 3 by 2 cm cuboid along the 3 by 2 face. Find outside area. [3 marks]

The result 9 by 3 by 2 has area $2(27 + 18 + 6) = 102$.

Answer: 102 cm²

6. A radius 2 cm, height 6 cm cylinder supports a matching cone of height 3 cm. Find total volume. [3 marks]

Cylinder 24π; cone 4π.

Answer: 28π cm³

7. Similar solids have volume ratio $125:343$. Find length ratio. [2 marks]

Take positive cube roots.

Answer: $5:7$

8. Estimate percentage error for an 80 cm reading with absolute error 0.4 cm, using 80 as reference. [2 marks]

$\frac{0.4}{80} \times 100 = 0.5.$

Answer: 0.5%

9. Compare $5 \times (\frac{2}{5})$ exactly with 5×0.4. [2 marks]

$\frac{2}{5} = 0.4$ exactly, so there is no rounding error.

Answer: Both 2

10. A rectangle is 10 by 5 cm, each to the nearest centimetre. Find lower area bound. [3 marks]

$9.5 \times 4.5 = 42.75.$

Answer: 42.75 cm²

11. A radius 3 cm, height 4 cm cylinder has a matching hemispherical top and exposed base. Find outside area. [3 marks]

Curve 24π; hemisphere 18π; base 9π.

Answer: 51π cm²

12. Convert 6500 cm³ to litres. [1 mark]

Divide by 1000.

Answer: 6.5 L

13. A similar enlargement has area factor 9. Find volume factor. [2 marks]

Length factor 3, volume factor 27.

Answer: 27

14. Compare trays from 24 by 18 cm card with corner cuts 2 cm and 3 cm. Which has greater volume? [4 marks]

$2 \times 20 \times 14 = 560.$

$3 \times 18 \times 12 = 648.$

Answer: The 3 cm cut:648 cm³ versus 560 cm³.

15. A job needs 5.3 L of paint sold in 2 L tins at 18 dollars each. Find minimum cost. [3 marks]

Buy 3 tins.

$3 \times 18 = 54.$

Answer: 54 dollars

16. A model is enlarged only in height. Why is k^3 not automatically the volume factor? [3 marks]

The cube law requires all three corresponding dimensions to scale by k.

Answer: There is no common similarity factor.