Marking guide | Measurement and scale

Measurement and scale - Practice test 1

16 questions | 37 marks | 55 minutes

Composite solids, scale factors and reliable measurement.

Equivalent correct methods earn the corresponding marks.

1. Find surface area of a closed cube of edge 4 cm. [1 mark]

$6 \times 4^2 = 96$.

Answer: 96 cm²

2. A $1:50$ drawing shows 7 cm. Find actual length in metres. [2 marks]

350 cm $= 3.5$ m.

Answer: 3.5 m

3. Similar solids have length factor 2. State their area factor. [1 mark]

$2^2 = 4$.

Answer: 4

4. A 16 cm reading is to the nearest centimetre. Give bounds. [2 marks]

Half-unit is 0.5 cm.

Answer: $15.5 \le L < 16.5$ cm

5. Two 3 cm cubes share one whole face. Find outside area. [3 marks]

$2 \times 54 - 2 \times 9 = 90$.

Answer: 90 cm²

6. A 10 by 6 by 4 cm block has a 2 by 3 by 4 cm hole removed. Find remaining volume. [2 marks]

$240 - 24 = 216.$

Answer: 216 cm³

7. A similar solid has volume 15 cm³ and length factor 3. Find new volume. [2 marks]

$15 \times 27 = 405.$

Answer: 405 cm³

8. A 50 m measurement has error 0.5 m. Estimate percentage error using 50 m as reference. [2 marks]

$\frac{0.5}{50} \times 100 = 1.$

Answer: 1%

9. Compare $9 \times (\frac{1}{9})$ exactly with 9×0.11. [2 marks]

Exact cancellation gives 1; rounded product 0.99.

Answer: 1 and 0.99

10. A hollow cylinder has outer radius 4 cm, inner radius 2 cm, height 5 cm. Find material volume. [3 marks]

$\pi(16 - 4)5 = 60\pi.$

Answer: 60π cm³

11. A cube of edge 4 cm supports a square-pyramid roof of slant height 3 cm. The square join is hidden. Find outside area. [3 marks]

Five square faces 80; roof $4 \times \frac{1}{2} \times 4 \times 3 = 24.$

Total 104.

Answer: 104 cm²

12. A box measures 25 by 16 by 10 cm internally. Find capacity. [2 marks]

4000 cm³ $= 4$ L.

Answer: 4 L

13. Similar shapes have areas 36 and 81 cm². A 10 cm side of the smaller matches what larger side? [3 marks]

Length factor $\sqrt{\frac{81}{36}} = 1.5$.

$10 \times 1.5 = 15$.

Answer: 15 cm

14. Cut 2 cm corner squares from a 30 by 20 cm card and fold an open tray. Find capacity. [3 marks]

Height 2; base 26 by 16.

$2 \times 26 \times 16 = 832$.

Answer: 832 cm³

15. A design needs 4 m² plus 15% waste. Material costs 20 dollars per m². Find cost before whole-sheet constraints. [3 marks]

$4 \times 1.15 \times 20 = 92$.

Answer: 92 dollars

16. A tank model gives 493.67391 L from centimetre-rounded dimensions. Give sensible reporting and one limitation. [3 marks]

Avoid unsupported decimal places.

Wall thickness, fill height or rounded dimensions affect capacity.

Answer: About 494 L; measurement and model uncertainty remain.