# Practical design models

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

**1.** Cut 2 cm squares from a 24 by 18 cm card. Find folded tray volume. [2 marks]

Base 20 by 14; height 2.

V=560.

**Answer:** 560 cm³

**2.** A box measures 40 by 25 by 12 cm internally. Find capacity. [2 marks]

V=12000 cm³=12 L.

**Answer:** 12 L

**3.** A cylinder has internal radius 1 m and usable height 1.5 m. Give exact litre capacity. [2 marks]

$V = 1.5\pi$ m³; multiply by 1000.

**Answer:** $1500\pi$ L

**4.** Compare closed boxes 10 by 10 by 20 cm and 10 by 5 by 40 cm. Both hold 2000 cm³. Which uses less material? [3 marks]

Their areas are 1000 and 1300 cm².

**Answer:** The 10 by 10 by 20 box.

**5.** A design needs 2.4 m² plus 10% waste. Material costs 18 dollars per m². Find the continuous-area cost. [2 marks]

Area=2.64 m².

2.64×18=47.52.

**Answer:** 47.52 dollars

**6.** A model uses outside dimensions but ignores 3 mm walls. Does it overestimate or underestimate usable capacity? Explain. [3 marks]

Walls reduce the internal dimensions and occupy some outside volume.

**Answer:** Overestimate.