eClassroom

GCSE Mathematics

Similar Shapes

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics

Section A — Foundation — Worked Solutions

[Fluency] Question 1

6÷3

∴ **Scale factor = 2**

[Fluency] Question 2

SF=12/8=1.5

Shorter side=5×1.5

∴ **7.5 cm**

[Fluency] Question 3

All three angles are identical (40°, 60°, 80°).

∴ **Yes, similar by AAA**

[Fluency] Question 4

Area SF=3^2=9

New area=12×9

∴ **108 cm^2**

[Fluency] Question 5

3×50000=150000cm=1.5km

∴ **1.5 km**

[Reasoning] Question 6

Length SF=10/4=2.5

Volume SF=2.5^3=15.625

Volume=48×15.625

∴ **750 cm^3**

[Reasoning] Question 7

SF=4/10=0.4

x=15×0.4

∴ **x = 6 cm**

[Reasoning] Question 8

(a) SA ratio=k^2

(b) Volume ratio=k^3

∴ **(a) k^2 (b) k^3**

[Problem Solving] Question 9

Length SF=9/6=1.5

Volume SF=1.5^3=3.375

Volume=80×3.375

∴ **270 cm^3**

[Problem Solving] Question 10

(a) SF=24/15=1.6

New shorter side=10×1.6=16cm

(b) Both have the same length-to-width ratio (3:2), so corresponding sides are proportional.

∴ **(a) 16 cm (b) Corresponding sides in same ratio (similar by SAS / proportional sides)**

Section B — Higher — Worked Solutions

[Fluency] Question 1

Vol ratio=8:64=1:8=1^3:2^3 → length ratio=1:2

SA ratio=1^2:2^2=1:4

∴ **(a) 1:2 (b) 1:4**

[Fluency] Question 2

Length ratio=√[3](27):√[3](64)=3:4

Area ratio=3^2:4^2

∴ **(a) 3:4 (b) 9:16**

[Fluency] Question 3

3/5=(x+1)/(x+3) → 3(x+3)=5(x+1)

3x+9=5x+5 → 2x=4

∴ **x = 2**

[Reasoning] Question 4

SA ratio=120:270=4:9 → length ratio=2:3 → vol ratio=8:27

Vol of larger=2×27/8

∴ **6.75 litres**

[Reasoning] Question 5

Let lengths be 5k and 3k

Perimeter=2(5k+3k)=16k=64 → k=4

∴ **20 cm × 12 cm**

[Reasoning] Question 6

Vol ratio=$(2/5)^3$=8/125

Vol of smaller=250×8/125

∴ **16 cm^3**

[Problem Solving] Question 7

Areas: A, 4A (SF=2, area×4), 9A (SF=3, area×9)

Shaded = 9A–4A

∴ **5A cm²**

[Problem Solving] Question 8

8.4×25000=210000cm

∴ **2.1 km**

[Problem Solving] Question 9

Volume SF=$(3/2)^3$=27/8

New volume=288π×27/8=972π

∴ **972π cm³**

[Problem Solving] Question 10

Area ratio=9:25 → length ratio=3:5

(b) 30×5/3=50

∴ **(a) 3:5 (b) 50 cm**