

8.5 Foundations of Math II

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1. a) $\frac{2}{3}$ for all sides similar

b) $\frac{4}{2} = 2$, $\frac{1}{0.5} = 2$, $\frac{2}{1} = 2$ similar

c) $\frac{9}{3} = 3$, $\frac{6}{2} = 3$ similar

d) $\frac{5}{2} = 2.5$, $\frac{10}{5} = 2$ not similar

2. a) Yes - they have the same scale ratio in all directions

b) i) $\frac{25}{22}$

ii) $\frac{22}{25}$

3. Scale 1:100 $k = 100$

length $52(100) = 5200 \text{ cm} = 52 \text{ m}$

beam $8.5(100) = 850 \text{ cm} = 8.5 \text{ m}$

height $43(100) = 4300 \text{ cm} = 43 \text{ m}$

4. a) $\frac{S}{M}$: $\frac{30}{45} = \frac{2}{3}$, $\frac{40}{60} = \frac{2}{3}$, $\frac{35}{52.5} = \frac{2}{3}$ similar

$\frac{M}{L}$: $\frac{60}{80} = \frac{3}{4}$, $\frac{45}{60} = \frac{3}{4}$, $\frac{52.5}{70} = \frac{3}{4}$ similar

they are similar

b) M is 24 cm tall

$$S = 24 \cdot \frac{2}{3} = 16 \text{ cm}$$

$$L = 24 \cdot \frac{4}{3} = 32 \text{ cm}$$

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5. 1:40 scale

$$\begin{array}{l} \text{length} \quad 21.5(40) = 860\text{cm} = 8.6\text{m} \\ \text{height} \quad 9.5(40) = 380\text{cm} = 3.8\text{m} \end{array}$$

6. 1:18 scale

$$\begin{array}{l} \text{length} \quad 206.3(18) = 3713.4\text{mm} = 371.34\text{cm} = 3.7134\text{m} \\ \text{width} \quad 93.5(18) = 1683\text{mm} = 168.3\text{cm} = 1.683\text{m} \\ \text{height} \quad 78.2(18) = 1407.6\text{mm} = 140.76\text{cm} = 1.4076\text{m} \end{array}$$

7. a) a scale factor of 2 would work.

$$\begin{array}{l} \text{b) height} \quad 75(2) = 150\text{cm} \\ \text{length} \quad 90(2) = 180\text{cm} \end{array}$$

8. $6.5\text{ft} \times 2.5\text{ft}$
 $78\text{in} \times 30\text{in}$

a) $\frac{26}{78} = \frac{1}{3}$

b) $30 \cdot \frac{1}{3} = 10\text{in}$

9. actual: 32 ft long 48 in wide
384 in

Scale 1:24

model: length $\frac{384}{24} = 16\text{in}$

width $\frac{48}{24} = 2\text{in}$