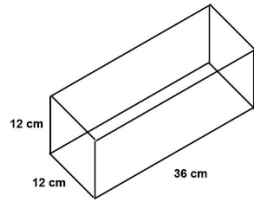


Scale Factors:

1. Tommi is given a rectangular prism with dimensions 12 cm by 12 cm by 36 cm. Tommi needs to draw a scale diagram of the prism using the scale factor 1:6.



$$\frac{\text{draw}}{\text{real}} = \frac{1}{6} = k$$

$$\frac{1}{6} = \frac{x}{12} \quad \frac{1}{6} = \frac{x}{36}$$

- Find new dimensions.
- Determine the area for the bottom of the given prism. Use scale factor to find area of scaled prism.
- Calculate volume of both prisms; use volumes to calculate scale factor.

new: $2 \times 2 \times 6$

Bottom: $12 \times 36 = 432 \text{ cm}^2$

$$\frac{\text{area}_1}{\text{area}_2} = k^2 \quad k = \frac{1}{6}$$

$$\frac{\text{small}}{\text{large}} \left(\frac{1}{6}\right)^2 = \frac{x}{432}$$

$$\frac{1}{36} = \frac{x}{432}$$

$x = 12$ bottom area 12 cm^2

Volume₁ = $12 \times 12 \times 36$ $V_2 = 2 \times 2 \times 6$

$V_1 = 5184$

$V_2 = 24$

$$k^3 = \frac{V_1 \text{ sm}}{V_2 \text{ LG}}$$

... $k = \frac{1}{6}$

$$k^3 = \frac{24}{5184}$$

$$k^3 = \frac{1}{216}$$

"cube root"
 $\sqrt[3]{1} \quad \sqrt[3]{216}$

✓ $k = \frac{1}{6}$

2. The surface area for the model of Sandra's car is 100 square cm. The scale factor for Sandra's car is 1:4. Determine the surface area of the actual car.

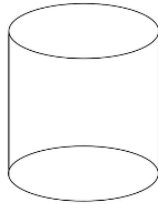
AREA $k^2 = \frac{A_1}{A_2}$ $k = \frac{1}{4}$ smaller
larger

$$\left(\frac{1}{4}\right)^2 = \frac{100}{x} \quad \dots \quad \frac{1}{16} = \frac{100}{x}$$

cross
mult

$$x = 1600 \text{ cm}^2$$

3. The volume of a cylindrical oil drum is 250 L. Determine volume of a model oil drum when the scale factor is 1:5.



$$k^3 = \frac{V_1}{V_2}$$

$$\left(\frac{1}{5}\right)^3 = \frac{x}{250}$$

$$\frac{1}{125} = \frac{x}{250}$$

$x = 2 \text{ L}$

small
large

4. Determine if model is similar to an original by comparing scale factor of each dimension.
Bighorn Sheep:

- Actual: height 96 cm, length 175 cm, horn circumference 60 cm.
- Model: height 16 cm, length 28 cm, horn circumference 10 cm.

} same dimensions



$$k = \frac{\text{model}}{\text{actual}} = \frac{\text{draw}}{\text{real}}$$

$$k = \frac{16}{96}$$

$$k = \frac{28}{175}$$

$$k = \frac{10}{60}$$

FRACTIONS OR % OR DECIMALS

$$k = 0.17 \quad k = 0.16 \quad k = 0.17$$

NOT ALL EQUAL SCALE FACTORS, NOT SIMILAR.