

Topic: Similar figures

14.01

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{24}{15} = 1.6$$

$$E_F(\text{volume}) = (1.6)^3 = 4.096$$

$$V_{\text{LARGE JAR}} = E_F(\text{volume}) \times V_{\text{SMALL JAR}}$$

$$V = 4.096 \times 750 = 3072 \text{ cm}^3$$

14.02

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{30}{20} = 1.5$$

$$E_F(\text{volume}) = (1.5)^3 = 3.375$$

$$V_{\text{LARGE JUG}} = E_F(\text{volume}) \times V_{\text{SMALL JUG}}$$

$$V = 3.375 \times 0.8 = 2.7 \text{ L}$$

14.03

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{9}{6} = 1.5$$

$$E_F(\text{volume}) = (1.5)^3 = 3.375$$

$$V_{\text{LARGE}} = E_F(\text{volume}) \times V_{\text{SMALL}}$$

$$V = 3.375 \times 30 = 101.25 \text{ ml}$$

14.04

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{10}{4} = 2.5$$

$$E_F(\text{area}) = (2.5)^2 = 6.25$$

$$A_{\text{LARGE}} = E_F(\text{area}) \times A_{\text{SMALL}}$$

$$A = 6.25 \times 18 = 112.5 \text{ cm}^2$$

14.05

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{24}{30} = 0.8$$

$$E_F(\text{volume}) = (0.8)^3 = 0.512$$

$$V_{\text{SMALL}} = E_F(\text{volume}) \times V_{\text{LARGE}}$$

$$V = 0.512 \times 1.2 = 0.6144$$

$$V = 0.61 \text{ litres.}$$

14.06

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{21}{14} = 1.5$$

$$E_F(\text{volume}) = (1.5)^3 = 3.375$$

$$V_{\text{LARGE}} = E_F(\text{volume}) \times V_{\text{SMALL}}$$

$$V = 3.375 \times 160 = 540 \text{ ml}$$

Topic: Similar Figures

14.07

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{10}{12} = \frac{5}{6}$$

$$\begin{aligned} BE &= E_F(\text{length}) \times CD \\ &= \frac{5}{6} \times 6 \\ &= 5\text{cm} \end{aligned}$$

14.08

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{3}{4.5} = 0.67$$

$$\begin{aligned} CD &= E_F(\text{length}) \times AB \\ &= 0.67 \times 8.4 \\ &= 5.6\text{m} \end{aligned}$$

14.09 a) $AQ = x + 3$

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{x+3}{6}$$

$$\begin{aligned} PQ &= E_F \times BC \\ &= \frac{x+3}{6} \times 8 \\ &= \frac{8(x+3)}{6} \\ &= \frac{4(x+3)}{3} \end{aligned} \quad \begin{aligned} &\Rightarrow \frac{4x}{3} + \frac{12}{3} \\ &= \frac{4x}{3} + 4 \\ &= 4 + \frac{4x}{3} \end{aligned}$$

14.10

$$E_F(\text{length}) = \frac{\text{new}}{\text{original}} = \frac{30}{24} = 1.25$$

$$E_F(\text{area}) = (1.25)^2 = 1.5625$$

$$\begin{aligned} A_{\text{LARGE}} &= E_F(\text{AREA}) \times A_{\text{SMALL}} \\ &= 1.5625 \times 400 \\ &= 625\text{ cm}^2 \end{aligned}$$

$$A_{\text{POTS}} = 625 - 400 = 225\text{ cm}^2$$