ENLARGEMENTS & REDUCTIONS Math 9

Scale: the relationship between a distance on a drawing, model or map and the actual distance

Scale reduction: the multiplier used to reduce the size of an object

Scale factor: the number (or ratio) used as a multiplier in scaling 1:5 $\frac{1}{5}$ 1 to 5

Scale enlargement: the multiplier used to enlarge the size of an object.

Ex 1) A common scale for collectible toy cars is 1:64. model : Actual / image.

a) **What does the ratio mean?**

the actual measurements of the real car is 64 times the length of the same measurement on the model

b) **Use the measurements of the scale model to determine the actual measurements of the 1959 Volkswagen Beetle. Express your answer in the most appropriate SI units. Round your answers as necessary. Actual length of the car is 6.4 cm and the actual diameter of the wheel is 5.6 mm.**

model / Actual

$\frac{6.4}{x} = \frac{1}{64}$

$6.4 \times \frac{x}{6.4} = \frac{64}{1} \cdot 6.4$

$x = 64 \times 6.4 = 409.6\text{ cm}$ or 410cm

Convert to m.

$410\text{cm} \times \frac{1\text{ m}}{100\text{ cm}} = \boxed{4.1\text{ m}}$

5.6mm =

$\frac{5.6}{x} = \frac{1}{64}$

$\frac{x}{5.6} = \frac{64}{1}$

$5.6 \times 64 = 358.4\text{mm}$

$358.4\text{mm} \times \frac{1\text{ cm}}{10\text{mm}}$

$\boxed{35.8\text{cm}}$ or 36cm

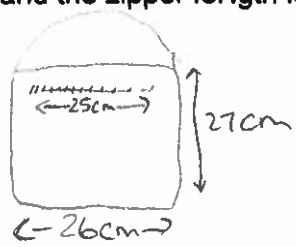
Ex 3) Art students are making bags in their textile course. Their assignment is to make new bags that are 60% of the size of the pattern shown, but maintain the original shape. What will be the reduced measurements? The width is 26 cm, the height is 27 cm and the zipper length is 25 cm.

$60\% = \frac{6}{10} = 0.60$

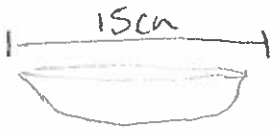
$25 \times 0.60 = \boxed{15 \text{ cm}}$

$26 \times 0.60 = \boxed{15.6 \text{cm}}$

$27 \times 0.60 = \boxed{16.2 \text{cm}}$



Ex 4) A canoe measures 15 cm in a diagram. How long is the actual canoe if the scale factor is 1:75?



$\frac{\text{model}}{\text{actual}} \quad \frac{15\text{cm}}{x} = \frac{1}{75}$

$(15)\frac{x}{15} = \frac{75}{1}(15)$

$x = 1125\text{cm}$ (more appropriate to use m.)

$1125\text{cm} \times \frac{1\ \text{m}}{100\ \text{cm}} = \boxed{11.25\text{m}}$