



Scale Diagrams:

Day 2

Warm Up March 30



1) An original photo of a cat has dimensions 18 cm by 40.5 cm. A second picture is made using a scale factor of 0.4. Determine the dimensions of the scaled picture. (Show your work)



Is this an enlargement or a reduction?

$$SF = 0.4$$

less than 1
it is a reduction

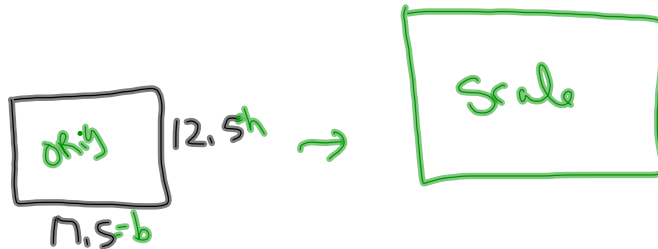
To find lengths of the scale picture:

original \times scale factor

$$\begin{aligned} \text{Scale height} &= \text{original height} \times SF \\ &= 18 \text{ cm} \times 0.4 \\ &= 7.2 \text{ cm} \end{aligned}$$



$$\begin{aligned} \text{Scale base} &= \text{original base} \times SF \\ &= 40.5 \text{ cm} \times 0.4 \\ &= 16.2 \text{ cm} \end{aligned}$$



a) $SF = 12$

$$\text{Scale} = OR \times SF$$

$$\begin{aligned} \text{Scale base} &= OR_{\text{base}} \times SF \\ &= 17.5 \times 12 \\ &= 210 \text{ cm} \end{aligned}$$

$$\text{height} = OR_{\text{height}} \times SF = 12.5 \times 12$$

150

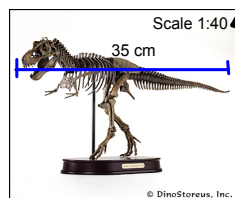


$$\textcircled{1} \quad \text{Scale factor} = \frac{\text{Scale length}}{\text{Original length}}$$

$$\textcircled{2} \quad \text{Scale length} = \text{Original} \times \text{Scale factor}$$

$$\textcircled{3} \quad \text{Original length} = \text{Scale length} \div \text{Scale factor}$$

2) The following is a scale diagram of "Sue" the T-Rex. Using the ratio determine the true length of Sue



$$\text{Scale factor} = \frac{1}{40}$$

$$\text{Scale length} = 35$$

To find the original size:

$$\text{Scale} \div \text{Scale factor}$$

$$35\text{cm} \div \frac{1}{40}$$

$$= 35\text{cm} \times \frac{40}{1}$$

$$= 1400\text{cm}$$

$$= 14\text{m}$$

SUE IS A SENSATION. It's not just that she's 42 feet long (14 m) and 65 million years old. She's the world's most complete, best preserved, and largest *Tyrannosaurus rex* skeleton. More than 10,000 visitors went to her May 17, 2000, debut at Chicago's Field Museum of Natural History.



$$\text{Scale Factor} = \frac{\text{Length of Scale Diagram}}{\text{Length of Original Diagram}}$$

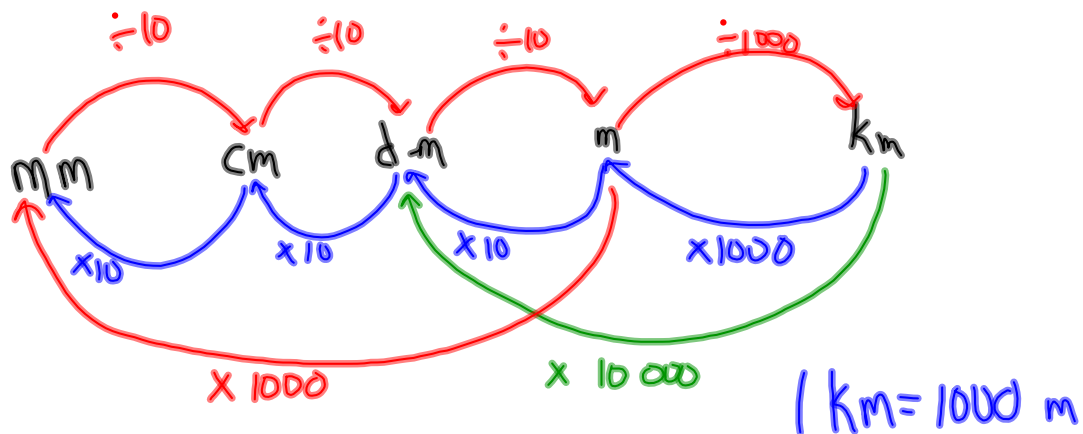
To find lengths of the scale picture:

original x scale factor

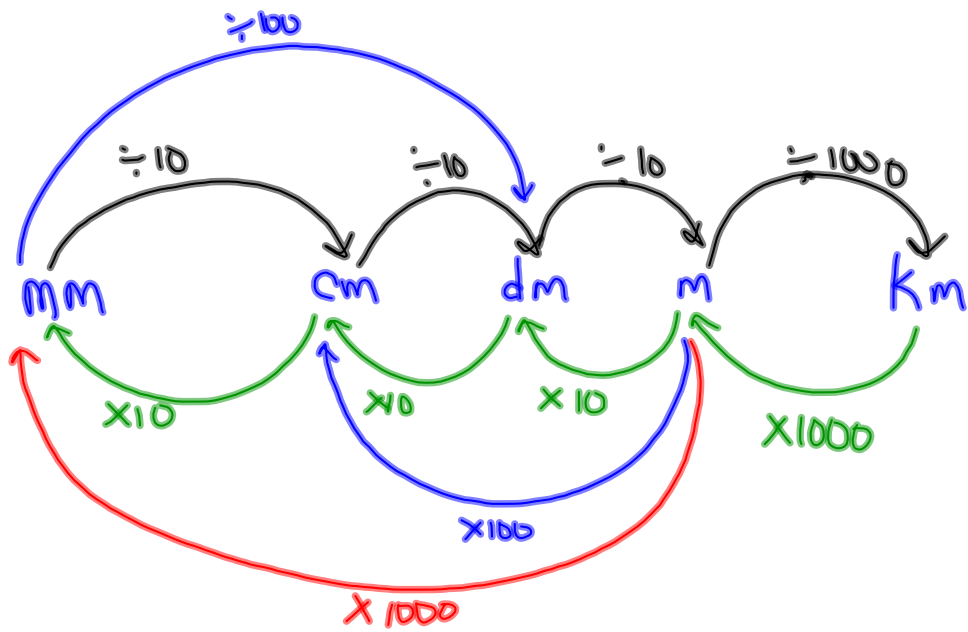
To find the original size:

Scale ÷ Scale factor

Text book use the words
 Actual/True \Rightarrow Original length
 Reduction or Enlargement \Rightarrow Scale length



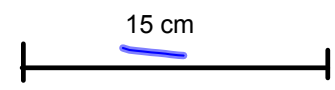
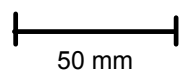
$$\underline{32 \text{ mm}} = \underline{0.032 \text{ m}}$$



Ex) 5 km = _____ cm

scale

original



50 mm = 5 cm

Find the Scale FACTOR

Must have same units

$$Sf = \frac{\text{Scale}}{\text{Original}} = \frac{5\text{cm}}{15\text{cm}} = 0.\overline{3}$$



March 30, 2012 Math 9



One frame of a film a projector is about 32 mm wide. The film is projected onto a giant screen. The image of the frame is 24 m high.

a) What is the scale factor of this enlargement?

$$\text{Original Width} = 32 \text{ mm} = 0.032 \text{ m}$$

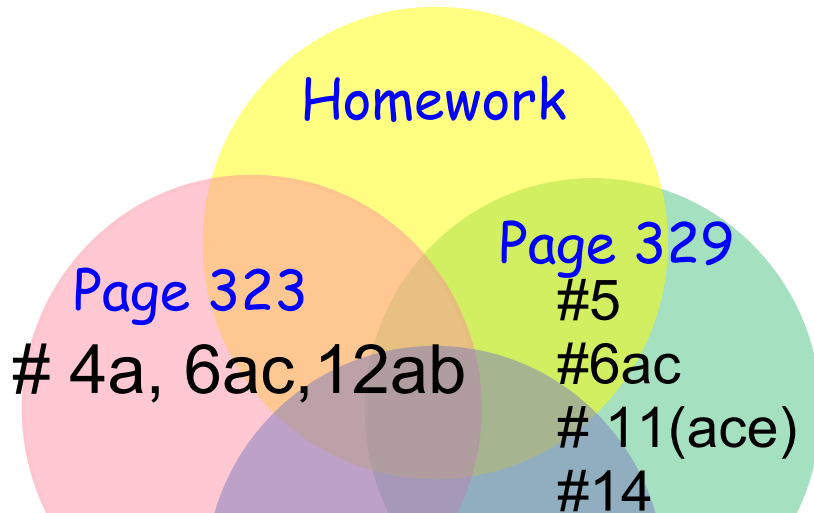
$$\text{Scale Width} = 24 \text{ m} = 24000 \text{ mm}$$

$$\text{Sf} = \frac{\text{Scale}}{\text{Original}} = \frac{24 \text{ m}}{0.032 \text{ m}} = 750$$

b) A boat is 8 mm wide on the film. How wide is the boat on the screen?

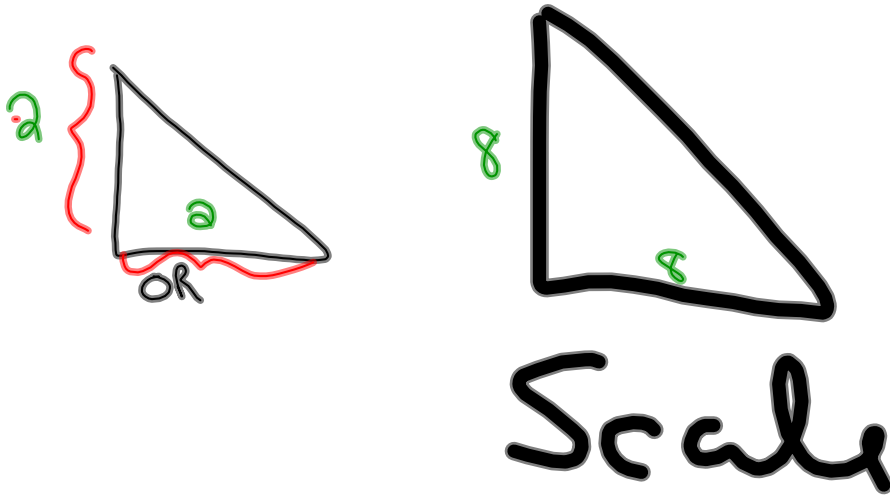
$$\text{Original} \quad \text{Sf} = 750$$

$$\begin{aligned} \text{Scale width} &= 8 \text{ mm} \times 750 \\ &= 6000 \text{ mm} \\ &= 6 \text{ m} \end{aligned}$$



7) $\overline{\hspace{2cm}}^{\text{scale}}$
 $4.9 \text{ cm} = 49 \text{ mm}$

8) $\overline{\hspace{2cm}}^{\text{scale}}$
 $1.5 \text{ cm} = 15 \text{ mm}$



$$SF = \frac{\text{Scale}}{\text{original}}$$

$$SF_{\text{bottom}} = \frac{8}{2} = 4$$

$$SF_{\text{side}} = \frac{8}{2} = 4$$

Homework Solutions

Page 323 #4, 5, 6

4a) $\frac{\text{Scale Bottom}}{\text{original Bottom}} = \frac{8}{2} = 4$ $\frac{\text{Scale Side}}{\text{original Side}} = \frac{8}{2} = 4$

Scale factor is 4

4b) $\frac{\text{Scale Bottom}}{\text{original Bottom}} = \frac{3}{2} = 1.5$ $\frac{\text{Scale Side}}{\text{original Side}} = \frac{6}{4} = 1.5$

Scale factor is 1.5

side length of original	scale factor	calculate length of scale side
a) 12 cm	3	12 cm x 3 = 36 cm
b) 82 mm	5/2	82 mm x 5/2 = 205 mm
c) 1.55 cm	4.2	1.55 cm x 4.2 = 6.51 cm
d) 45 mm	3.8	45 mm x 3.8 = 171 mm
e) 0.8 cm	12.5	0.8 cm x 12.5 = 10 cm

6) Original 17.5 cm by 12.5 cm

a) $17.5 \times 12 = 210$ cm
 $12.5 \times 12 = 150$ cm
 210 cm by 150 cm

b) $17.5 \times 20 = 350$ cm
 $12.5 \times 20 = 250$ cm
 350 cm by 250 cm

c) $17.5 \times 3.5 = 61.25$ cm
 $12.5 \times 3.5 = 43.75$ cm
 61.25 cm by 43.75 cm
 rounded to nearest cm
 61 cm by 44 cm

c) $17.5 \times (4.25) = 74.375$ cm
 $12.5 \times 4.25 = 53.125$ cm
 Rounded to nearest cm
 74 cm by 53 cm

Here is a scale diagram of back yard which has a scale of 1:125

If the true dimensions of the pool (in cm) has width 500 cm and length is 937.5 cm, what are the deminsions of the pool on the diagram?

