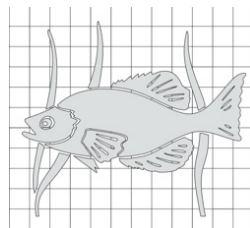
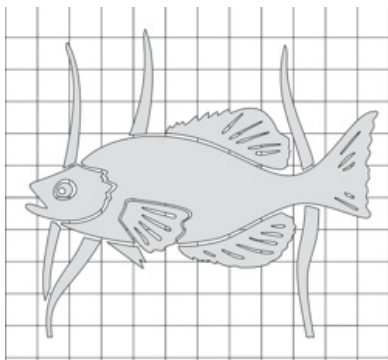


Chapter 7: Similarity and Transformations

Mar 26-10:37 AM



Scale Diagrams:

A diagram that is an enlargement or reduction of another diagram.

Mar 11-7:36 PM

The measurements in each diagram are compared.



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

$$SF = \frac{s}{o}$$

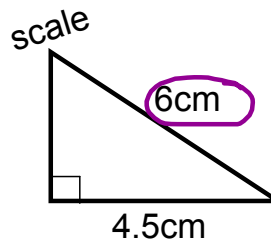
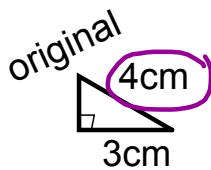


The **scale factor** can be written as a fraction or decimal.

If the scale factor is **less than one**, the diagram is a **reduction**, **larger than one** indicates the diagram is an **enlargement**.

Mar 11-7:53 PM

When pairs of corresponding lengths have the same scale factor, we say that the corresponding lengths are **proportional**.



Hypotenuse

$$\frac{\text{scale}}{\text{original}} = \frac{6}{4}$$

$$= 1.5$$


Leg

$$\frac{\text{scale}}{\text{original}} = \frac{4.5}{3}$$

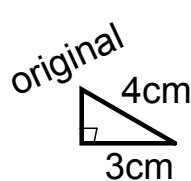
$$= 1.5$$

Mar 11-8:14 PM

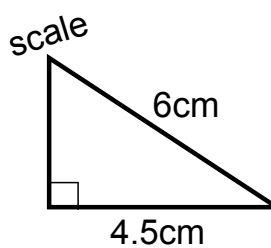
When pairs of corresponding lengths have the same scale factor, we say that the corresponding lengths are **proportional**.



original



scale



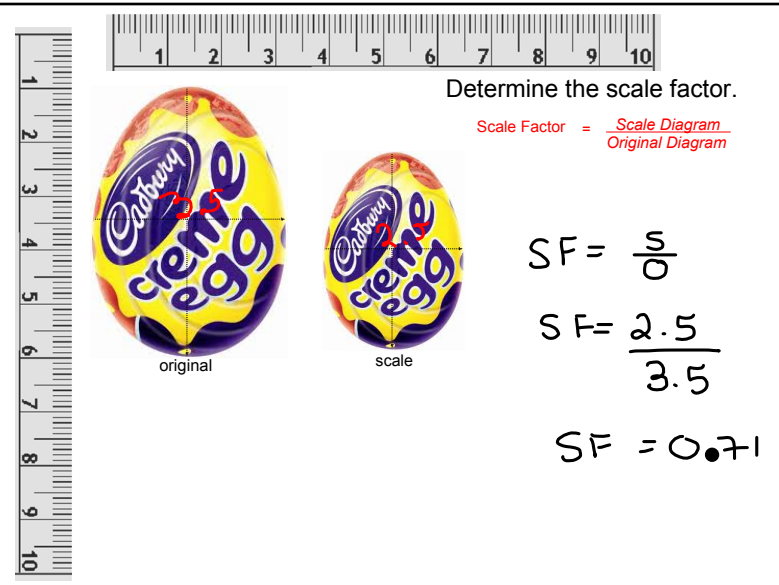
Hypotenuse

$$\frac{\text{scale}}{\text{original}} = \frac{\text{scale}}{\text{original}}$$

Leg

$$\frac{\text{scale}}{\text{original}} = \frac{\text{scale}}{\text{original}}$$

Mar 11-8:14 PM



Determine the scale factor.

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

$$SF = \frac{5}{3.5}$$

$$SF = \frac{2.5}{3.5}$$

$$SF = 0.71$$

x = 0.71

Mar 11-8:06 PM

SF = 2

3 → y

5 → x

$y = 6$

$SF = \frac{S}{O}$

$2 = \frac{y}{3}$

$y = 2 \times 3$

$y = 6$

$x = 10$

$SF = \frac{S}{O}$

$2 = \frac{x}{5}$

$x = 2 \times 5$

$x = 10$

Apr 14-9:08 AM

This photo of longhouses has dimensions 9 cm by 6 cm.

The photo is to be enlarged by a scale factor of $\frac{7}{2}$.

Calculate the dimensions of the enlargement.

original

6 cm

9 cm

scale

$x = 31.5$

$y = 21$

$SF = \frac{S}{O}$ $\frac{7}{2} = \frac{x}{9}$ $x = \frac{7 \times 9}{2}$ $x = 31.5$	$SF = \frac{S}{O}$ $\frac{7}{2} = \frac{y}{6}$ $y = \frac{7 \times 6}{2}$ $y = 21$
---	---

Mar 11-8:52 PM

$SF = \frac{5}{10}$
 $SF = \frac{7}{10}$
 $= 0.7$

$x = 8 \times 0.7$
 $x = 5.6$

Apr 14-9:12 AM

$SF = \frac{5}{12}$
 $= \frac{8}{3}$
 $= 2.\bar{6}$

$y = 12 \times \frac{8}{3}$
 $y = 32$

Apr 14-9:12 AM

Sometimes you are only given the scale diagram....

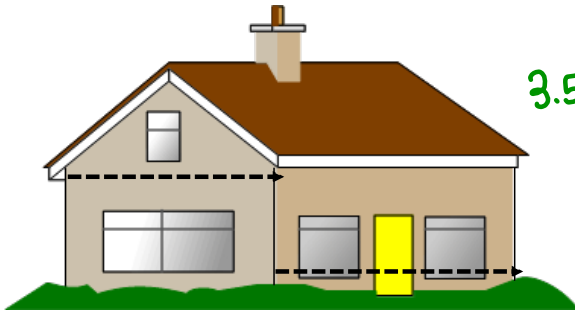
A scale may be given as a ratio.

The scale on this scale diagram of a house is 1:150.

This means that 1cm on the diagram represents 150 cm or 1.5m on the house.

In other words... the scale factor is $\frac{1}{150}$

How wide is the actual house??



$$1 : 150$$

$$3.5 \text{ cm} : x$$

$$x = 525 \text{ cm}$$



Mar 11-9:07 PM

Handwritten work for a scale problem:

$$\text{SF } \times \left(\begin{array}{l} 2.5 \text{ cm} : 300 \text{ km} \\ \frac{12}{2.5} = 4.8 \end{array} \right) \times 4.8$$

$$12 \text{ cm} : x$$

$$x = 1440$$

$$\frac{x}{300} = \frac{12}{2.5}$$

$$x = \frac{12 \times 300}{2.5}$$



$$x = 1440$$


Apr 10-9:13 AM

Scale Diagrams:

Is this an enlargement or a reduction?

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)



Mar 11-7:36 PM

$1\text{ cm} = 10\text{ mm}$

$1\text{ m} = 100\text{ cm}$

$1\text{ m} = 1000\text{ mm}$

Homework

mm $\xrightarrow{10}$ cm $\xrightarrow{100}$ m

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#4, 5, 6, 8, 9, 12

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#4, 5, 6, 8, 11(ace), 12b, 14

Four data sets