Name _____ Period _____

Scale Drawings

A scale drawing is _____

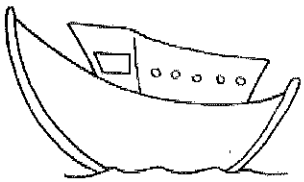
_____

_____

The _____ of the _____ _____ are

in _____ to the actual object.

EXAMPLE: A model boat is 8 inches long. The actual boat the model represents is 120 feet long. What is the scale of the model?



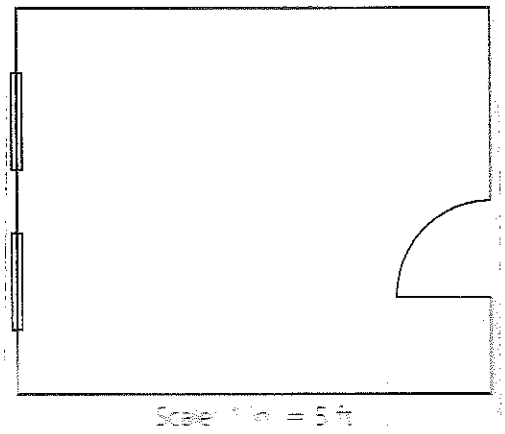
Write a ratio: $\frac{model\ length}{actual\ length}$ = _____

Simplify the ratio: _____

Rulers, along with ratios and proportions, can be used to solve problems involving scale drawings.

A scale drawing of a bedroom is shown below. What are the actual dimensions of this bedroom?

Measure the length and width of the drawing with a ruler.



The length is _____. The width is _____.

Set up proportions using the scale to find the actual dimensions.

Length : $\frac{1\ inch}{5\ feet} =$ _____ Width : $\frac{1\ inch}{5\ feet} =$ _____

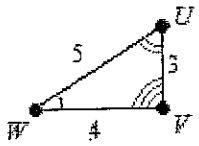
L = _____ W = _____

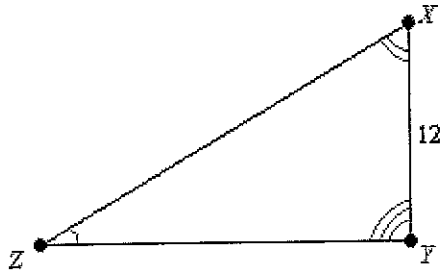
The length of the actual bedroom is _____. The width is _____.

Scale Factor

Suppose you have two _____ _____, one larger than the other. The _____ is the _____ of the length of a side of one figure to the length of the corresponding side of the other figure.

Example:





Here $\frac{XY}{UV} =$ ___ . So, the scale factor is _____.

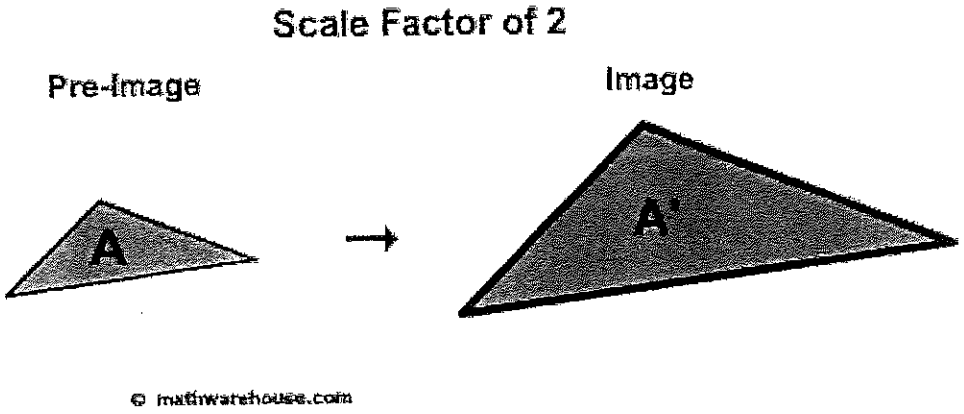
Note that when a two-dimensional figure is enlarged (dilated) by a scale factor of k, the area of the figure is changed by a factor of k^2, and the volume is changed by a factor of k^3.

What is a dilation?

A dilation is a _____ that changes the _____ of the image. The scale factor measures how much _____ or _____ the image is. Below is a picture of each type of _____ (one that gets larger and one that gets smaller).

Example 1

The picture below shows a dilation with a scale factor of 2. This means that the image, A' (A prime), is twice as large as the pre-image A. Like other transformations, prime notation is used to distinguish the image from the pre-image. The image always has a prime after the letter such as A' .



1) Use a ruler to measure Pre-Image A in centimeters, then, find the area of Pre-Image A. The height of this triangle is one centimeter. Also, find the area of Image A.

Area of Pre-Image A :

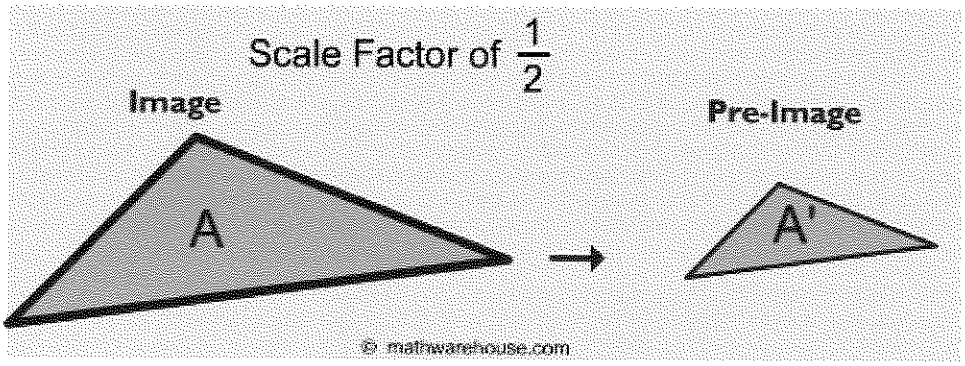
Area of Image A' :

2) Create a dilation with a scale factor of 3 in the space below. Find the area of the new figure.

Example 2

Dilations can also reduce the size of shape. The picture below demonstrates a dilation of ½.

Any time that the scale factor is a fraction, the image will get smaller.



3) Use a ruler to measure Image A in centimeters, then, find its area. of Pre-Image A'. The height of this triangle is two centimeters. Also, find the area of Pre-Image A'.

Area of Pre-Image A :

Area of Image A' :

4) Use a ruler to measure Image A, then, create a dilation with a scale factor of 1/3 in the space below. Find the area of the new figure.

5) What observation can you make about the areas of dilations? Explain.