

**Math 1030 #17E**  
**Scaling:**  
**Starting with Area and Volume**

If there are two proportionately identical objects, the scale factor is the number you multiply the lengths of the original object to get the lengths of the new object

## Scaling Laws:

- Lengths scale with the scaling factor
- Areas scale with the square of the scaling factor
- Volumes scale with the cube of the scaling Factor

Variation on Terminology		When length doubles	When length is scaled by $\frac{1}{3}$
Length Scale Factor	$a$	$2^1 = 2$	$\left(\frac{1}{3}\right)^1 = \frac{1}{3}$
Area Scale Factor	$a^2$	$2^2 = 4$	$\left(\frac{1}{3}\right)^2 = \frac{1}{9}$
Volume Scale Factor	$a^3$	$2^3 = 8$	$\left(\frac{1}{3}\right)^3 = \frac{1}{27}$



