

# Math 1513 - College Algebra

## Written Assignment 1 - Due 2012.06.09

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Directions: Please answer the following question in complete sentences. Be sure to label all geometric objects in any illustrations. I will accept an answer in a scanned image format, in a Word document or as a pdf.

Question: Due to the work of Albert Einstein and other physicists who labored on space-time relationships, it is known that the faster an object moves the shorter it appears to become. This phenomenon is modeled by the *Lorenz Transformation*

$$L = L_0 \sqrt{1 - \left(\frac{v}{c}\right)^2},$$

where  $L_0$  is the length of the object at rest,  $L$  is the relative length when the object is moving at velocity  $v$ , and  $c$  is the speed of light. Factor the radicand and use the result to determine the relative length of a 12 inch ruler if it is shot past a stationary observer at 0.75 times the speed of light.