Dimensional Analysis

1. Given 1 foot (ft) is about 30.5 centimeters (cm):

   (a) convert 5 ft and 4 inches into cm

   (b) convert 1 meter and 25cm into ft

   (c) convert 2 cubic feet into cm^3

2. If a raindrop's mass is 65mg on average and 5.1×10^5 raindrops fall on a lawn every minute, what mass in (kg) of rain falls on the lawn in 1 hour and 15 minutes?

Variation

3. Suppose y varies directly as x. If $y = 6$ when $x = 30$, find y when $x = 120$.

4. The intensity (I) of light varies inversely as the square of the distance (d) from the light source.

   (a) If $I = 4$ when $d = 3$, what is I when $d = 2.1$?

   (b) If $I = 4$ when $d = 3$, what is d when $I = 7$?

   (c) If a person doubles her/his distance from a lamp, what happens to the intensity of the light at her new location?