

Assignment 8

Math 1030

Due Monday, November 5th

1. Logarithmic Scales and Inverse Square Laws

(a) How many times as much energy is released by an earthquake of magnitude 7 as by one of magnitude 5? (Problem 8D-20)

(b) What is the loudness, in decibels, of a sound 20 million times as loud as the softest audible sound? (Problem 8D-27)

(c) How many times greater is the intensity of sound from a concert speaker at a distance of 1 meter than the intensity at a distance of 100 meters? (Problem 8D-32)

(d) What is the hydrogen (technically, hydronium) ion concentration of a solution with a pH of 2.5? (Problem 8D-38)

2. Logarithms

Solve each of the following equations for x :

(a) $15 = 10^x$

(b) $x = \log_5 7$

(c) $7 = 4 + 6^x$

(d) $\log_{10}(x) = 3.7$

(e) $15,000 = 3 \times (4 + 3)^x$

(f) $18,000 = 2^{3^x}$