Answer on Question #48883 – Math – Algebra

The atmospheric pressure P in pounds per square inch (psi) is given by

P = 14.7 e^(−0.21 a), where a is the altitude above sea level (in miles). If a city has an atmospheric pressure of 13.11 psi, what is its altitude? (Recall that 1 mi = 5,280 ft. Round your answer to the nearest foot.)

Solution.

$$\boldsymbol{P = 14.7e^{-0.21a} \;\rightarrow\; lnP = ln14.7 - 0.21a \;\rightarrow}$$

$$\boldsymbol{\rightarrow \quad a = \frac{ln14.7 - lnP}{0.21} = \frac{ln14.7 - ln13.11}{0.21} = 0.5451\ miles.}$$

$$\boldsymbol{a = 0.5451 * 5280 = 2878\ ft.}$$