

Math 1613 - Trigonometry

Written Assignment 2 - Due 2017.06.18

Directions: Please answer the following question in complete sentences. Be sure to label all geometric objects in any illustrations (if any). I will accept an answer in a scanned image format, as a pdf, or as a picture taken and sent from your awesome smart phone.

Question: Artificial satellites that orbit Earth often use VHF signals to communicate with the ground. VHF signals travel in straight lines. The height h of the satellite above Earth and the time T that the satellite can communicate with a fixed location on the ground are related by the model

$$h = R \left(\frac{1}{\cos\left(\frac{180T}{P}\right)} - 1 \right),$$

where $R = 3955$ mi is the radius of the Earth and P is the period for the satellite to orbit Earth.

- (a) Find h to the nearest mile when $T = 25$ min and $P = 140$ min. (Evaluate the cosine function in degree mode).
- (b) What is the value of h to the nearest mile if T is increased to 30 min?