

April 15<sup>th</sup>

A satellite makes a circular orbit around the earth at a constant altitude.

What change in altitude is needed to lengthen each orbit by one mile?

Orbit length = circumference  $C = \pi \times d$

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$$C + 1 = \pi \times d + 1$$

$$C + 1 = \pi \times \left( d + \frac{1}{\pi} \right)$$

So the diameter has increase by  $\frac{1}{\pi}$  miles

So altitude (radius) has to increase by  $\frac{1}{2\pi}$  miles = **0.16 miles**

(which is about 840 feet!)