HW 11-4 Soln)

We can break the oscillation up into two 'half' cycles that have different periods. If the l;ength were always L, the period would be

 $P_{left} = 2\pi [L/g]^{1/2}$ 

And if the length were always  $^{2}/_{3}L$ , the period would be

 $P_{right} = 2\pi [(2L/3)/g]^{1/2}$ 

The motion consists in half of a 'left' cycle and half of a 'right' cycle, so that the period of oscillation is

 $P_{tot} = {}^1/_2 P_{left} + {}^1/_2 P_{right}$ 

 $P_{tot} = \pi [L/g]^{1/2} + \pi [(2L/3)/g]^{1/2} = \pi [L/g]^{1/2} \{1 + \frac{2}{3}^{-1/2}\} = \frac{5.71 \ [L/g]^{1/2}}{5.71 \ [L/g]^{1/2}}$