PM-7 Soln)

Rewrite the expression as

$$\beta = \frac{1}{V}\frac{\Delta V}{\Delta T} \quad .$$

Since the pressure is constant, the ideal gas law tells us that

$$P\,\Delta V = nR\Delta T \quad \rightarrow \quad \frac{\Delta V}{\Delta T} = \frac{nR}{P}.$$

Then,

$$\beta = \frac{1}{V}\left(\frac{nR}{P}\right) = \frac{1}{T} \quad .$$