

11. When the temperature changes from T to $T + \Delta T$ the diameter of the mirror changes from D to $D + \Delta D$, where $\Delta D = \alpha D \Delta T$. Here α is the coefficient of linear expansion for Pyrex glass ($3.2 \times 10^{-6}/\text{C}^\circ$, according to Table 19-2). The range of values for the diameters can be found by setting ΔT equal to the temperature range. Thus $\Delta D = (3.2 \times 10^{-6}/\text{C}^\circ)(200 \text{ in.})(60 \text{ C}^\circ) = 3.84 \times 10^{-2} \text{ in.}$ Since $1 \text{ in.} = 2.54 \text{ cm} = 2.54 \times 10^4 \mu\text{m}$, this is $960 \mu\text{m}$.