

99. (a) A change of five Celsius degrees is equivalent to a change of nine Fahrenheit degrees. Using Table 19-2,

$$\alpha = (23 \times 10^{-6}/\text{C}^\circ) \left( \frac{5 \text{ C}^\circ}{9 \text{ F}^\circ} \right) = 13 \times 10^{-6}/\text{F}^\circ .$$

- (b) For  $\Delta T = 55 \text{ F}^\circ$  and  $L = 6.0 \text{ m}$ , we find  $\Delta L = L\alpha\Delta T = 0.0042 \text{ m}$ .