1. Solve the following story problem using variation.

The height that a tomato plant reaches during a growing season varies directly with the number of days of sunlight and inversely with the average temperature. Suppose that a plant that gets 40 days of sunlight with an average temperature of 72° Fahrenheit will grow to a height of 20 inches. How tall will a plant grow if it gets 30 days of sunlight and the average temperature is only 60° Fahrenheit?

\[ H = \frac{kD}{T} \]

\[ 20 \text{ in} = \frac{k(40 \text{ days})}{72^\circ} \]

\[ 20 \cdot 72 = k(40) \]

\[ \frac{20 \cdot 72}{40} = k \]

\[ k = 36 \]

\[ H = \frac{36 \text{ in}}{T} \]

So then \[ H = \frac{36(30)}{60^\circ} = \frac{36}{2} = 18 \text{ inches} \]