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### PHYS 1110 Worksheet: Temperature and such

1. What distance from the Earth's center would a geosynchronous satellite, with an orbital period of 86,164 s, orbit?  $G = 6.67408 \times 10^{-11} \text{ N} \cdot \text{m}^2/\text{kg}^2$ ;  $m_E = 5.972 \times 10^{24} \text{ kg}$ .
2. The bridge of US 287 over the railroad tracks just south of town is 180.0 meters long. Its structure is steel, with a linear coefficient of thermal expansion of  $11 \times 10^{-6}/^\circ\text{C}$ . How much shorter is the bridge on a cold Winter day at  $-20^\circ\text{C}$  than on a warm Summer day at  $+30^\circ\text{C}$ ?
3. USDA nutrition labels on food assume a daily energy intake of 2000 Calories. How many joules is this?