

30. Recognizing that the force in the cable must equal the total weight (since there is no acceleration), we employ Eq. 7-47:

$$P = Fv \cos \theta = mg \left( \frac{\Delta x}{\Delta t} \right)$$

where we have used the fact that  $\theta = 0^\circ$  (both the force of the cable and the elevator's motion are upward). Thus,

$$P = (3.0 \times 10^3 \text{ kg}) (9.8 \text{ m/s}^2) \left( \frac{210 \text{ m}}{23 \text{ s}} \right) = 2.7 \times 10^5 \text{ W} .$$