70. (a) We use Eq. 7-48:

$$P = Fv \implies F = \frac{16.0\,\text{kW}}{15.0\,\text{m/s}} = 1.07 \text{ kN} .$$

(b) We add to our previous result the downhill pull of gravity $mg\sin\theta$ where $\theta = \tan^{-1}(8/100)$.

$$F' = 1.07 \times 10^3 + (1710)(9.8)\sin 4.57^\circ = 2.40 \times 10^3$$

in SI units (N). Therefore,

$$P' = F'v = (2.40\,\text{kN}))(15.0\,\text{m/s}) = 36 \text{ kW} .$$

(c) For the engine to be off but the (downhill) velocity to remain constant, the downhill component of gravity must equal the magnitude of the retarding forces:

$$mg\sin\theta = F .$$

Using F from part (a), we find $\theta = 3.65^\circ$ which corresponds to $\tan\theta = 0.0638 \approx 6.4\%$.