Problem 1

If a car delivers an average 100 hp to the road and weighs a total of 1.2 tons, how long will it take to go from 0-60 mph?

$1.2 \text{ tons} \rightarrow 2400 \text{ lbs}$

$60 \text{ mph} \rightarrow 88 \text{ ft/s}$

$$W = \Delta KE + \Delta \overset{0}{PE}$$

$$W = \frac{1}{2} m V_f^2 - \frac{1}{2} m V_i^{\overset{0}{2}} = \frac{1}{2}\left(\frac{2400}{32.2}\right)(88)^2 = 288596 \text{ ft lbs}$$

$$P = (100 * 550)\frac{ft\ lbs}{s} = \frac{W}{t}$$

$$\boxed{t = 5.25 s}$$