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

$$1.2\,\text{tons}\left(2000\frac{\text{lb}}{\text{ton}}\right) = 2400\,\text{lb}$$

$$60\,\text{mph}\left(\frac{5280\,\text{ft/mile}}{3600\,\text{s/hr}}\right) = 88\,\text{ft/s}$$

$$100\,\text{hp}\left(550\,\frac{\text{ft·lb}}{\text{s·hp}}\right) = 55000\,\frac{\text{ft·lb}}{\text{s}}$$

$$W = \Delta KE + \Delta PE$$

$$W = \frac{1}{2}mv_f^2 = \frac{1}{2}\left(\frac{2400}{32.2}\right)(88)^2 = 288596\,\text{ft·lb}$$

$$P = \frac{W}{\Delta t} \Rightarrow 55000 = \frac{288596}{\Delta t}$$

$$\boxed{\Delta t = 5.25\,\text{s}}$$