8. Our notation is as follows: $M = 1360\,\text{kg}$ is the mass of the automobile; $L = 3.05\,\text{m}$ is the horizontal distance between the axles; $\ell = 3.05 - 1.78 = 1.27\,\text{m}$ is the horizontal distance from the rear axle to the center of mass; F_1 is the force exerted on each front wheel; and, F_2 is the force exerted on each back wheel.

   (a) Taking torques about the rear axle, we find

$$F_1 = \frac{Mg\ell}{2L} = \frac{(1360\text{kg})\left(9.8\text{m/s}^2\right)(1.27\,\text{m})}{2(3.05\,\text{m})} = 2.77 \times 10^3 \text{ N} .$$

   (b) Equilibrium of forces leads to $2F_1 + 2F_2 = Mg$, from which we obtain $F_2 = 3.89 \times 10^3\,\text{N}$.