<p style="text-align:center; color:red;">$4\ kN$</p>

Question

Find the average force(F) needed to accelerate a car weighing(m) $500\ kg$ from rest ($v_0 = 0$) to (v_1) $72\ km/h$ in a distance(x) of $25\ m$?

Solution

Assume force being constant (magnitude and direction). Then we can use formula $Fx = E$, where $E -$ kinetic energy. $E = \frac{mv_1^2}{2}$.

Factor out F:

$$F = \frac{mv_1^2}{2x}$$

Calculate:

$$F = \frac{500 * \left(72 * \dfrac{1000}{3600}\right)^2}{2 * 25} = 10 * 20^2 = 4000\ (N) = 4\ (kN)$$