Question. What is the kinetic energy of an automobile weighing $1600\ kg$ when it travels (a) $25.0\ km/h$ (b) $50.0\ km/h$?

Given. $m = 1600\ kg;\ v_1 = 25.0\ km/hr \approx 6.94\ m/s;\ v_2 = 50.0\ km/hr \approx 13.89\ m/s.$

Find. $KE_1, KE_2 - ?$

Solution.

According to the formula of the kinetic energy

$$KE = \frac{mv^2}{2},$$

we have

$$KE_1 = \frac{mv_1^2}{2} = \frac{1600 \cdot 6.94^2}{2} = 38530.88\ J,$$

$$KE_2 = \frac{mv_2^2}{2} = \frac{1600 \cdot 13.89^2}{2} = 154345.68\ J.$$

Answer. $KE_1 = 38530.88\ J,\ KE_2 = 154345.68\ J.$

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