

**Answer on Question#40908 – Physics – Mechanics**

A 1100 kg car traveling at 27 m/s starts to decelerate and comes to a complete stop after 578 m. What is the average braking force acting on the car?

**Solution:**

$m = 1100 \text{ kg}$  – mass of the car;

$v = 27 \frac{\text{m}}{\text{s}}$  – initial speed of the car;

$d = 578\text{m}$  – traveled distance;

Loss of KE by car = work done by friction force:

$$W = \Delta E_k \quad (1)$$

Work done by friction force (minus sign - because the force is directed against the movement)

$$W = -F \cdot d \quad (2)$$

$$\Delta E_k = E_{k2} - E_{k1} = 0 - \frac{mv^2}{2} = -\frac{mv^2}{2} \quad (3)$$

(3)and(2)in(1):

$$-F \cdot d = -\frac{mv^2}{2}$$

$$F = \frac{mv^2}{2d} = \frac{1100 \text{ kg} \cdot \left(27 \frac{\text{m}}{\text{s}}\right)^2}{2 \cdot 578\text{m}} = 694\text{N}$$

**Answer:** average braking force acting on the car is equal to 694N.