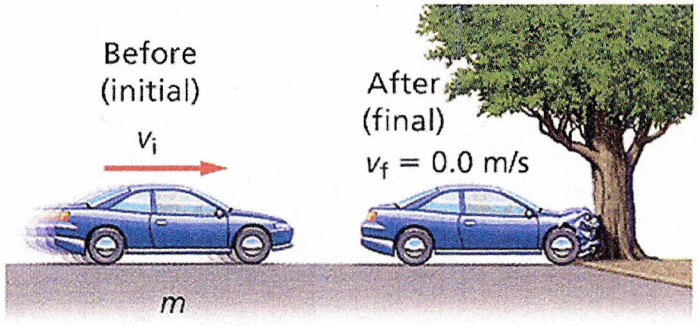
Warm up 03.26.2018

A 2.05×10^3 kg car, m, has a speed, v_i, of 12.0 m/s. The car then hits a tree. The tree doesn't move, and the car comes to rest.

a. Find the change in kinetic energy of the car.

b. Find the amount of work done

c. Find the size of the force that pushed in the front of the car by 50 cm.



$m = 2.05 \times 10^3 kg$

$v_i = 12 m/s$

$v_f = 0 m/s$

$d = 50 cm$

a) $\Delta KE = ?$

b) $W = ?$

c) $F = ?$

a) $\Delta KE = KE_f - KE_i$

$KE_f = \frac{1}{2} m \cdot v_f^2 = 0 J$

$\Delta KE = - KE_i$

$|\Delta KE| = KE_i = \frac{1}{2} m \cdot v_i^2$

$|\Delta KE| = \frac{1}{2} \cdot 2.05 \times 10^3 kg \cdot (12 m/s)^2 = \ldots J = 147600 J$

b) $W = \Delta KE = 147600 J$

c) $W = F \cdot d$

$F = \frac{W}{d} = \frac{147600 J}{0.5 m} = 295200 N$

$F = 295200 N$