Question #73264, Physics / Other

A car of mass 1360kg descends from a hill of height 86m at a constant speed. Assuming all o the gravitational potential energy lost by the car goes into heating the brakes, estimate the rise in the temperature of the brakes (it takes 16 KJ of energy to increase the temperature of the brake drums by 1 K) ignore any enery losses to the surrounding

Solution

$$\Delta E_{gp} = C\Delta T \Leftrightarrow \Delta T = \frac{\Delta E_{gp}}{C} = \frac{mg\Delta h}{C};$$

$$\Delta T = \frac{1360 \times 9.81 \times 86}{16 \times 10^3} = 71.7 \text{ K}$$

Answer: the rise in temperature is 71.7 K.