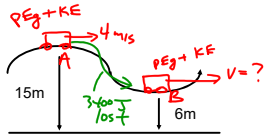
A 200 kg roller coaster is travelling at 4.0 m/s at the top of the first hill 15 m high. If 3400 J of heat energy is lost during the ride what is the speed at point B which is 6.0 m high? Use Total Energy conservation.



$TE_A = TE_B$

$mgh + \frac{1}{2}mv^2 = \frac{1}{2}mv'^2 + mgh' + 3400\,J$

$(200)(9.81)(15) + \frac{1}{2}(200)(4)^2 = \frac{1}{2}(200)V^2 + (200)(9.81)(6) + 3400\,J$

$(200)(9.81)(9) + 1600\,J = 100V^2 + 3400\,J$

$17658\,J + 1600\,J - 3400\,J = 100V^2$

$\frac{15858\,J}{100} = \frac{100V^2}{100}$

$\sqrt{158.58} = \sqrt{V}$

$12.6\ m/s = V$

Dec 3-3:52 PM