

If a 1000kg car traveling at 30m/s comes to a stop after its brakes are applied, how much will the temperature rise in each of the four 3.0kg brake disks?

(for simplicity, assume that the disks are made of metal with a heat capacity of $C=500\text{J/kg}$)

(Also assume that the heat is evenly distributed between all four brake disks.)

A hot water heater is operated by solar power. If the solar collector has an area of 10 m^2 and the power delivered by sunlight is 420W/m^2 , how long will it take to increase the temperature of $1/2\text{ m}^3$ of water from 20 degrees C to 50 degrees C?

($W = \text{J/s}$)

(1 cubic cm of water = 1g)