

Topic 4B: Conservation of Energy

Skill 32: Internal Energy - work done by friction

Work done by friction is equal to energy lost to heat

It is the difference between the total mechanical energy at the outset (initial) and at the end (final)

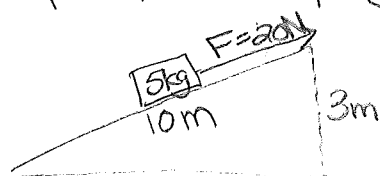
$$E_T = PE + KE + Q$$

$$Q = E_T - (PE + KE)$$

It can also be found by

$$W = F_f d$$

Example: What is the work done against friction for a 5kg object pushed up a 10m ramp by a force of 20N



The work done against friction is the difference between the work done & the amount of mechanical energy gained.

$$W = E_T = PE + Q$$

$$F_d = E_T = mgh + Q$$

$$(20N)(10m) = (5kg)(9.81m/s^2)(3m) + Q$$

$$200Nm = 147.15J + Q$$

$$Q = 52.8J$$