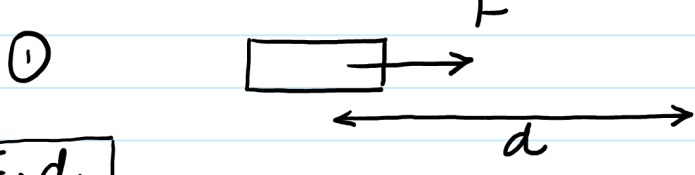
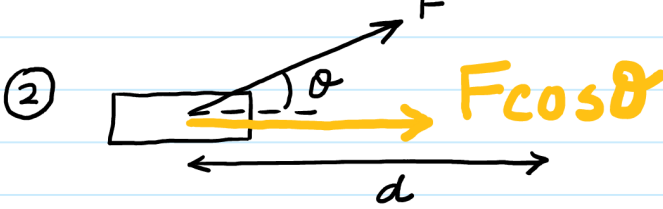


Concept of Work done

definition :: product of force and the distance moved in the direction of the force



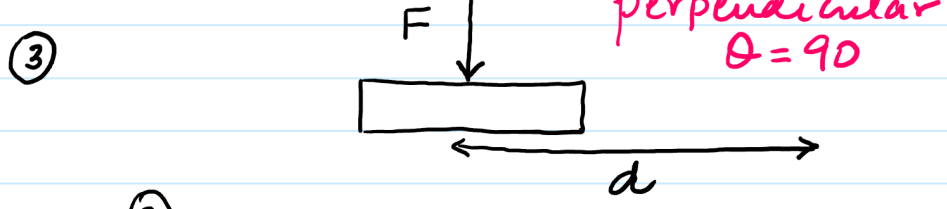
$W = F \cdot d$



$W = F \cdot d$ ~~x~~
(b/c F & d are NOT in the same direction / plane)

$W = (F \cos \theta) \times (d)$ or

$W = F \cdot d \cdot \cos \theta$



from (2)

$W = F \cdot d \cdot \cos 90^\circ$ since $\cos 90^\circ = 0$

∴ we can conclude that if F & d are perpendicular then Workdone is ZERO

$W = 0$

Exams (standard notation).

Work done by the driving force / forward force / Engine.

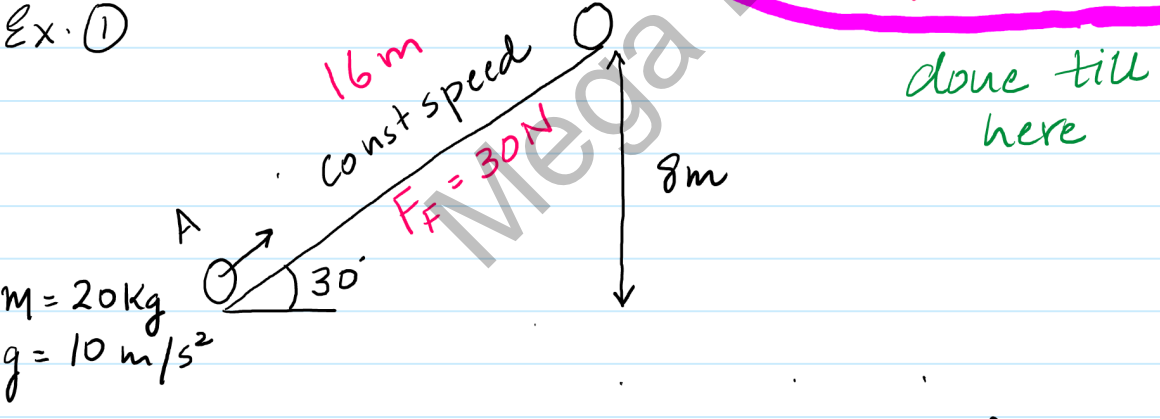
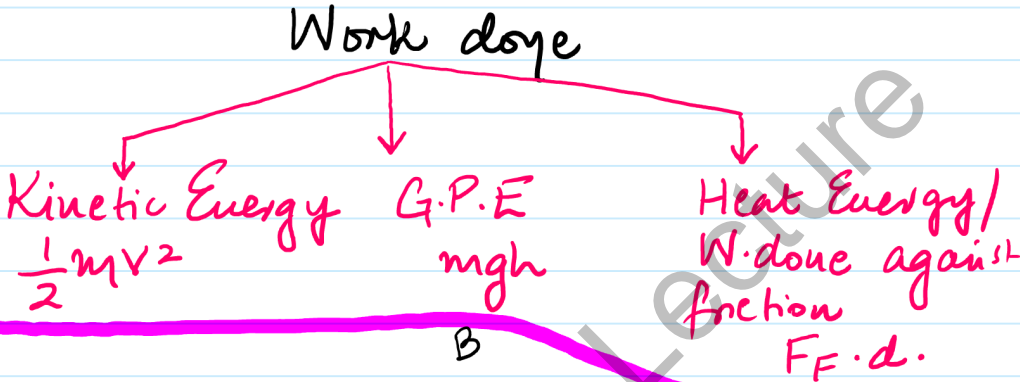
$W = F_D \times d$ where $F_D = \text{driving force}$

Work done against resistance / against friction / by the opposing force

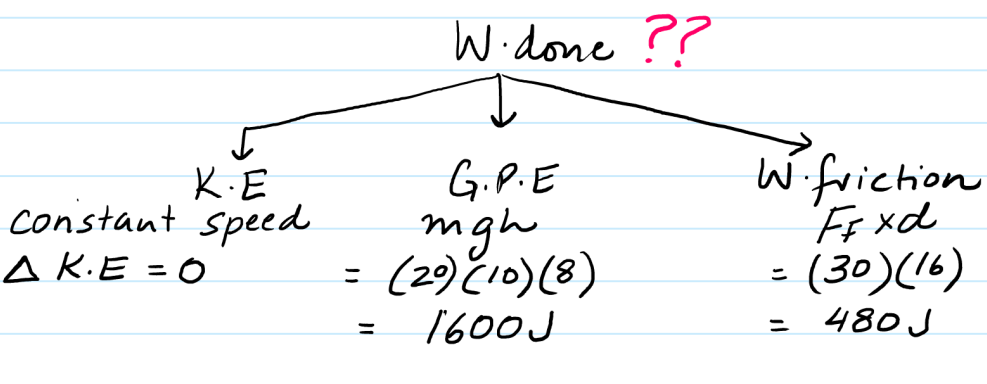
$W = F_F \times d$ where $F_F = \text{frictional force}$

Q: What happens to the work done on any object?

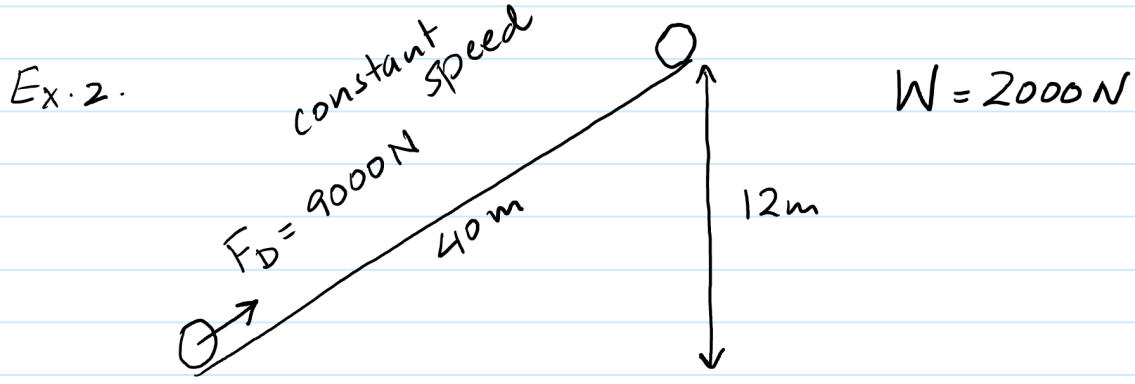
In mechanics, work done always gets converted into some form of Energy, which is why w. done & Energy have the same units (J).



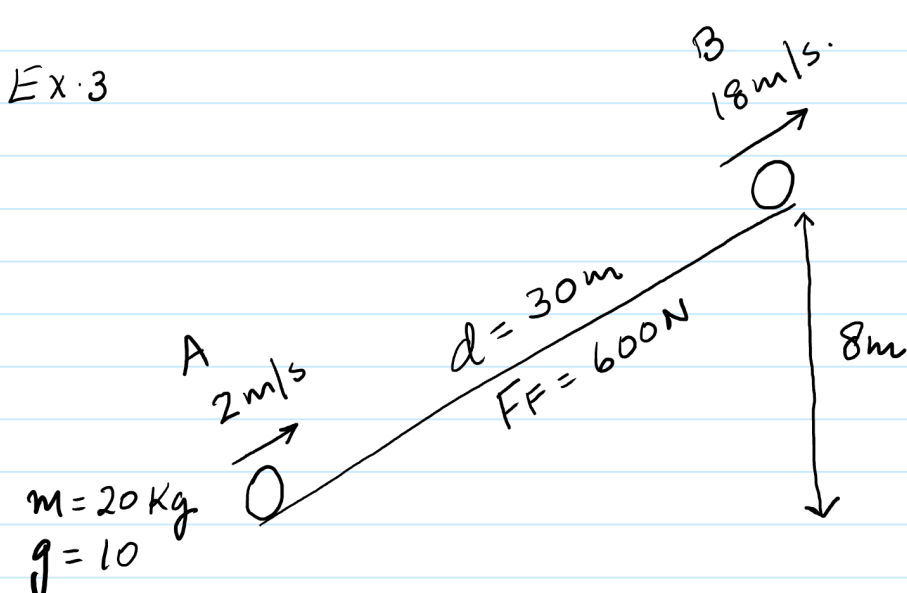
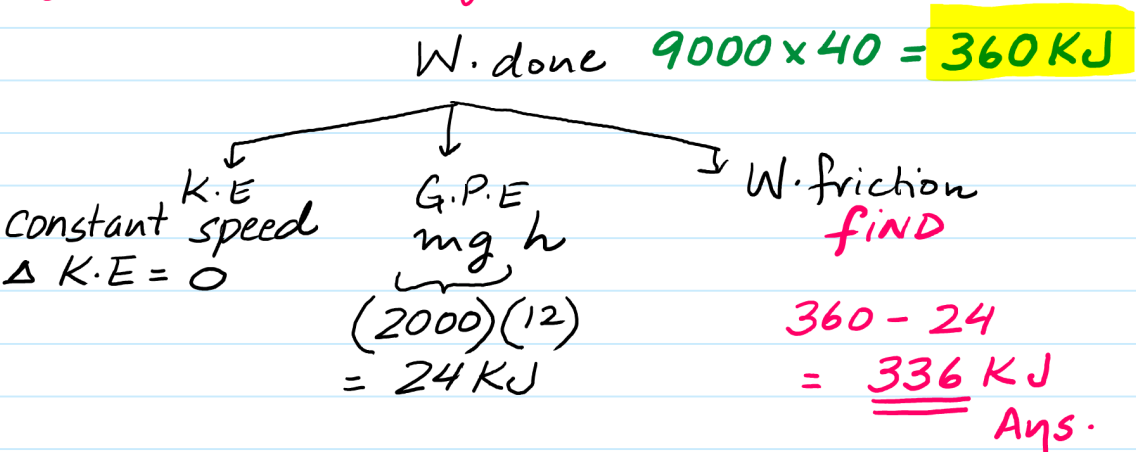
Calculate the W. done in moving the object from A to B



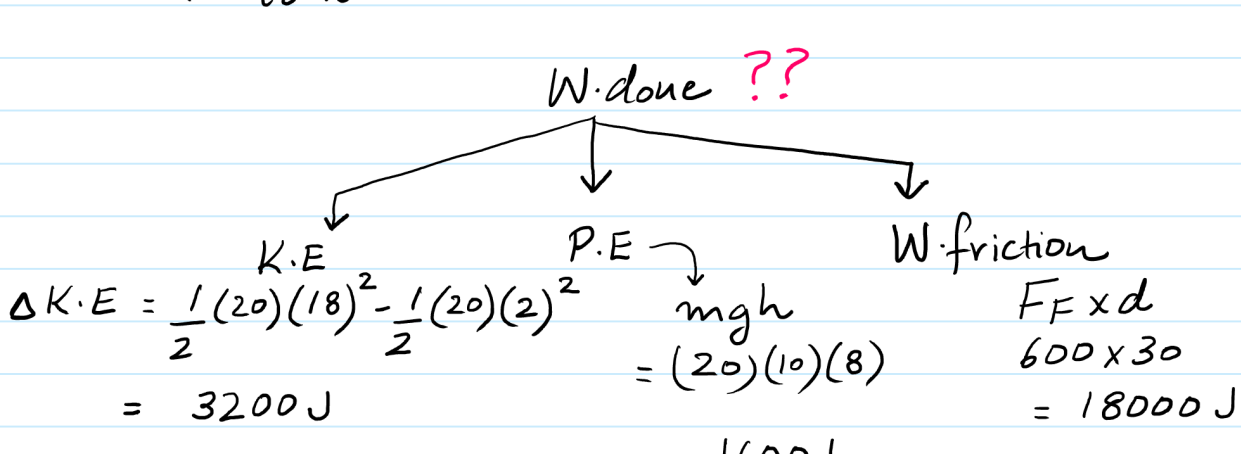
∴ W. done in moving the object = $1600 + 480 = 2080 \text{ J}$ Aqs.



Cal. the Energy dissipated as heat i.e (find W. done against friction.



Cal. W. done in moving the object from A to B



W. done = $3200 + 1600 + 18000 = 22800 \text{ J}$