§6-1 Work and Energy

Work is not energy itself but related to the transfer of energy to an object.

Work is equal to the product of the force acting in the direction of an object's displacement and its displacement.

$$W = F_{\parallel} \Delta d$$

N·m

where W is the work done on an object (J)

$F_{\parallel}$ is the force acting in the direction of the displacement (N)

Δd is the displacement (m)

Note that work is a scalar quantity.

mp 220

$F_{\parallel} = 2.00 \times 10^2 \text{ N}$

$\Delta d = 3.00 \text{ m}$

$W = ?$

$W = F_{\parallel} \Delta d$

$W = (2.00 \times 10^2 \text{ N})(3.00 \text{ m})$

$W = 6.00 \times 10^2 \text{ J}$

When work is zero (p222)

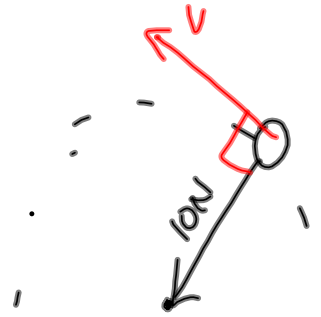
1. Applying a force but there is no motion
2. Uniform motion with no force acting on the object.
3. When the force acts perpendicularly to the displacement.

MP 224

radius = 1.0m

F = 10N

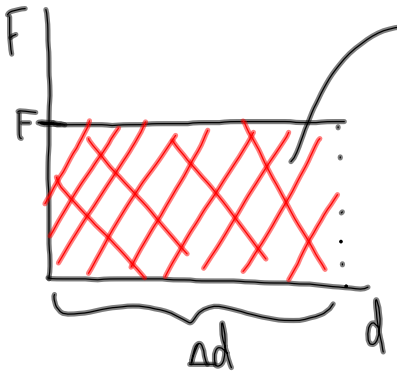
W = ?



No work is done since the force is always perpendicular to the motion.

Work done by a changing force:

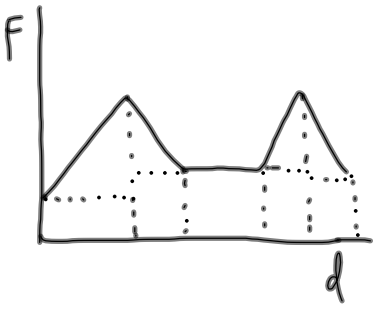
Consider a constant force:



area of rectangle = lxw

$W = F\Delta d$

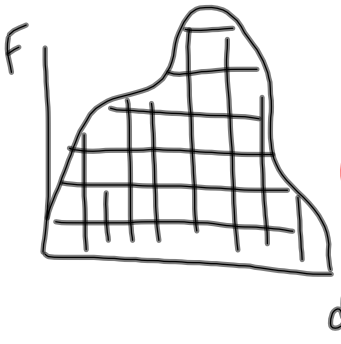
Area (F-d) = Work



Area of triangle = $\frac{1}{2}bh$

Area of rectangle = bh

Area of trapezoid = $\frac{1}{2}(h_1+h_2)b$



count squares or use technology

TODO:

PP|221 ($W = F_{||}\Delta d$)

PP|225 ($W = F_{||}\Delta d$ and Network scenarios)

PP|229|11 (area) - Look over MP|227 first.