

Work Done - Ramp Example #1

Find the work done to push a 40.0 kg box up a 5.0m long ramp at a constant speed if the angle of the ramp is 25 degrees.  $\mu = 0.30$

$\sin \theta = \frac{op}{h} = \frac{F_{gx}}{F_g}$   
 $F_{gx} = F_g \sin \theta$   
 $= 392.4 \sin 25$   
 $= 165.84$

$F_{gy} = F_g \cos \theta$   
 $N = 292.4 \cos 25$   
 $N = 355.64$

$f = \mu N = (0.3)(355.64) = 106.69 \text{ N}$   
 $F = F_{gx} + f = 165.84 + 106.69$   
 $F = 272.53 \text{ N}$

$W = Fd$   
 $= (272.53 \text{ N})(5 \text{ m}) = 1362.65 \text{ J}$

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