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$m = 45\ kg$

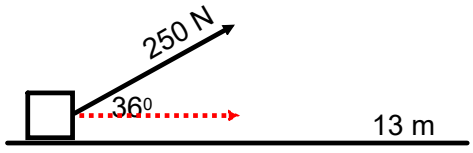
$d_{||} = 13\ m$

$F_a = 250\ N$

$\theta = 36^0$

$t = 1.5\ min$

↳ $90.0\ s$



$P = W/t = Fd_{||}/t$

$P = W/t = [\text{Cos } 36(250N)13m]/90.\ s$

$P = 29W$

How much work does gravity do moving a 45 kg box down a 9.0 m ramp that's at a 22^0 angle?

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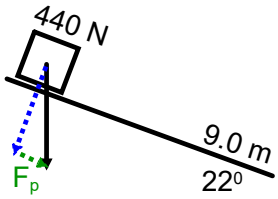
m = 45 kg



$W = Fd_{||}$

$W = \sin 22(45kg)g(9.0\ m) = 1500\ J$

A 77% efficient winch (lever) operates a 66% efficient lever that lifts a 2200 kg crate. What velocity does it lift at if 6.33 kW of power is delivered to the winch?

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$E_1 = 77\%$

$E_2 = 66\%$

$m_r = 2200$ kg

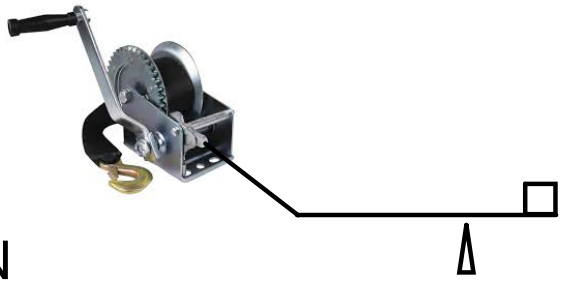
$F_r \hookrightarrow 21600$ N

$v = ?$

$P = 6.33$ kW

$E_t = E_1 \times E_2$

$E_t = .77(.66) = 51\%$



$P = W/t = Fd/t = Fv$

$v = P/F = .51(6330\text{ W})/21600\text{ N}$

$v = .15$ m/s

A ramp is 7.7 m long and 2.7 m high.

a) What force is needed to slide a 33 kg box up the ramp?

b) What force is needed to slide a 33 kg box up the ramp if its efficiency is 77%?

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a) What force is needed to slide a 33 kg box up the ramp?

$$Eff = \frac{Wo}{Wi} X\ 100$$

$E = W_o/W_i \times 100$

$W_i = W_o/E = (F_r \times d_r)/E$

$F_e(d_e) = (F_r \times d_r)/E$

$F_e = [(F_r \times d_r)]/[E(d_e)]$

$F_e = (320N \times 2.7\ m)/7.7\ m = 110\ N$

b) What force is needed to slide a 33 kg box up the ramp if its efficiency is 77%?

$$Eff = \frac{W_i}{W_o} X\ 100$$

$Eff = Frdr/Fede$

$Fe = Frdr/Eff(de) = 320N(2.7m)/.77(7.7m) = 145N$