

P11 - 6.5 - Power/Efficiency Notes

Power: The ability to do Work in Watts

How much Power if 30 J of Work is done on an object for 5s?

$$P = \frac{W}{t}$$

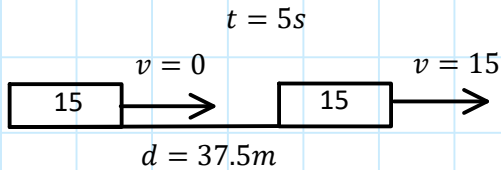
$$P = \frac{30}{5}$$

$$P = 6 W$$

$P = \frac{W}{t}$

$P = \frac{J}{s} = W$

Find "P" it takes a Motor to Push 15 kg object from rest to $15 \frac{m}{s}$ over a $d = 37.5 m$ in 5 s?



$$W = Fd$$

$$W = Fd$$

$$W = 45(37.5)$$

$$W = 1687.5 J$$

$$P = \frac{W}{t}$$

$$P = \frac{1687.5}{5}$$

$$P = 337.5 W$$

$v_f = v_i + at$	$F = ma$	$d = v_i + \frac{1}{2}at^2$
$v_f = at$	$F = 15(3)$	$d = \frac{1}{2}(3)(5)^2$
$a = \frac{v_f}{t}$	$F = 45 N$	$d = 37.5m!$
$a = \frac{15}{5}$	Dynamics – Work –	
$a = 3 \frac{m}{s^2}$	Power – Kinematics Link	

What is the Efficiency of the Motor if it says 500 W on the side?

$$E_{ff} = \frac{P_{out}}{P_{in}}$$

$$E_{ff} = \frac{375}{500}$$

$E_{ff} = \frac{\text{Power Out}}{\text{Power In}}$

$$E_{ff} = 75\% \text{ Efficient}$$