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Work & Power Review

- A quick summary
- tips and tricks
- pictures and drawing, graphs, diagrams
- All formulas
- 2 examples
- 1-5 prac. prob

- Work is basically done when a force is applied to an object and makes it move.
- There are two formulas (N/m)

① $W = F \cdot d$

where F = force(N) and d = distance(m)

② $W = F \cdot \cos\theta \cdot d$

F = →

d = →

$\cos\theta$ = the degree of a certain angle = θ.

$\frac{adj}{hyp}$

- Power is basically the rate at which you do work.

There are two formulas

① $P = W/t$ — time(s)

Power (watts), Watts (N/m)

② $P = f \cdot V$ — velocity (m/s)

Power (watts) / force (N)

★ tips

-some people may find this easy, but it actually took me a while to learn.
-when working with power, if your going to use the second formula $P = f \cdot v$, and you have to find P and f, always remember $f = m \cdot a$. i always forgot that and got confused because i was like how am i supposed to solve for two things.

example:
How much power would you need to push a 20kg lawn mover at 2m/s?

step 1: formula
$P = f \cdot v$

$P = ?$
$f = ? \; 196N$
$v = 2m/s$

$P = 196 \cdot 2$
$392_{(W)}$

★ $f = m \cdot a$
$f = 20kg \cdot 9.8$
$f = 196N$

★ - a tip for work is only use the formula close when your dealing with angles,
-every thing else is pretty explanatory.

ex: If you push a box 7m along floor with 895nm worth of work how much does box weigh? and what if we needed to get that box on a truck with ramp incline of 18°?

$W = F \cdot d$

$\frac{895}{7} = \frac{F \cdot 7m}{7}$

$F = 127N$

* dont forget to label

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

$W = 127N \cdot \cos 18° \cdot 7m$

$W = 845nm$

See what happened there.

* Practice problems 1-5

simple 1.) How much power would you need to push a 50kg box at 3m/s (impossible, I know).

$P = f \cdot V$

$P = 490 \times 3$

$P = 1470 (W)$

$F = 490N$

$V = 3m/s$

$f = m \cdot A$

$f = 50kg \cdot 9.8$

$490N$

2.) How much time would it take if the final power applied to an object is 2360(w) and 3N/m was applied to it?

$P = W/t$

$\frac{2360}{3} = \frac{3N/m \cdot t}{3}$

$t = 786.65$

3.) How much work would be needed to move a 30kg box for 4 meters?

$W = F \cdot d$

$W = (30 \cdot 9.8) \cdot 4$

$W = 1176 n/m$

4.) In tug o war, team X pulled team Y with a force of 80000N a distance of 30meters. the angle they pulled at was 13°. How much work has been done?

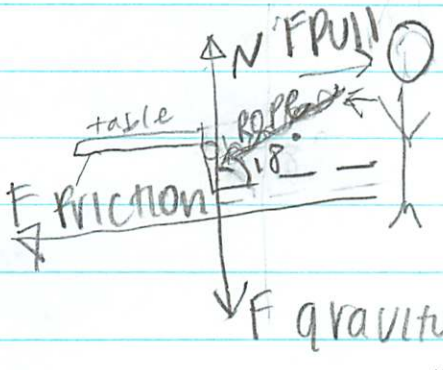
$W = F \cdot \cos\theta \cdot d$

$W = 80,000 \cdot 30 \cdot \cos 13°$

$W = 80,000 \cdot 30 \cdot .974$

$W = 2338488 n/m$

5.) draw a free body diagram a someone pulling a rope tied to a table at an angle of 18°



* i just realized you can't see this.

bigger: