Worksheet work and power

**1.** Ralph uses a force of $\left(2x10^{3}\hat{x}-70\hat{y}\right)N$ to push his car along a road for 1x103m due east

(+x direction) essentially wrecking it. It takes him 5x102s to do this.

 A) Calculate the amount of work that wreck it Ralph did on the car.

 B) Calculate the amount of power that he generated.

 C) At what angle (from the positive x axis) is Ralph pushing the car?

**2.** A Machamp exerts a force of 1500N as he pushes on the side of the building. After pushing for 2 minutes, the baffled and somewhat dismayed Machmap finds that the building has not moved. How much work did Machamp do? How do you know?

**3.** Julie must lift three 1x102kg boxes up to a ledge that is 2m above the ground.

 A) Calculate the ***weight*** of one of the boxes.

 B) How much ***force*** must be exerted to lift one box?

 C) Calculate the amount of work Julie does to lift one box up to the ledge.

 D) How much work would have to be done to lift all three boxes up to the ledge, one box at

 a time?

 E) Calculate the ***weight*** of all three boxes.

 F) How much ***force*** must be exerted to lift all three boxes at once?

 G) Calculate how much work would be done to lift all three boxes up to the ledge at the same

 time.

 H) How does the amount of work done lifting the three boxes, one at a time, compare to the

 amount of work done lifting the three boxes all at once? Explain why.