Worksheet work and power solutions

**1.** Ralph uses a force of 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 a building. After pushing for 2 minutes, to Machamp's perplexed surprise, the building has not moved. How much work did Machamp do? How do you know?

None – nothing moved (zero distance)

**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?

Since weight is a force pulling downward, you would need to exert a force greater than the weight of 980N to lift a single 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?

5.88 x 103 J ( 1.96 x 103 J per box times 3)

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

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

Since weight is a force pulling downward, you would need to exert a force greater than the weight of 2.94 x 103 N 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.

Same – same boxes moved to the same height