Honors Physics **Quiz 5b: Work, Energy, and Impulse** **Mr. Kelley**

$W = F \cdot d \cdot (\cos\theta)$ $\quad$ $\text{KE} = \frac{1}{2}mv^2$ $\quad$ $\text{PE} = mgh$ $\quad$ $I = \Delta\rho = F \cdot t$ $\quad$ $P = \frac{W}{t} = \frac{E}{t}$

You may talk to your classmates about this quiz, however you may not have the quiz out and there should be no writing while discussing the quiz.

Please show work on a separate sheet and attach.

1. A .08 kg ball falls from a height of 20 m. If it rebounds to a height of 16 m, what impulse did the ground provide in the bounce?

2. A 3×10^4 kg rocket ship is traveling through space at 200 m/s. What impulse is required to change its speed to 250 m/s?

3. How much work is done in lifting a 19 kg crate 10 m vertically?

4. What force is required to push a 19 kg crate up a frictionless incline at 45° to a final height of 10 m?

5. A 50 kg cart starts from rest and rolls 100 m down a hill at $\theta = 30°$. After the 100 m, the cart is moving with a speed of 25 m/s. How much energy was lost to friction?

6. PG&E charges about \$0.15 per kW·hr of electricity. How much does it cost to run a 60 W light bulb for one hour?