

### Unit # 3 - Work, Energy and Power Review Questions

1. A 10.0MN force lifts a block over 15.0m. How much power (in Mega Watts) was developed if it took 2.00s? **[75.0MW]**
2. For what 3 types of situations is the work done on an object 0J. Explain each situation and give an example for each situation.
3. For what type of situation is the work done on an object negative. Give an example.
4. A 10.0kg block is being pulled by a rope with a 20.0N force. If the work done by this rope on the block is 148J, calculate the distance the block has been pulled. **[7.4m]**
5. If you could generate 34J of work in a time period of 3.0 minutes, how much power would you have generated? **[0.19W]**
6. You run up a set of 20 stairs in 6.0s. If you have a mass of 65kg. What amount of power have you generated (in Watts and horse power )in this vertical ascent if each step is 19 cm. **[4.0x10<sup>2</sup>W or 0.54hp]**
7. Mr.S throws a soccer ball at Robert with a speed of 20m/s. The kinetic energy of the ball is 300J at this speed. Determine the mass of the chalk. **[1.5kg]**
8. Assuming your mass is 55kg and you decide to break out of ASD to join QA because you heard it was a cool school. The only problem is there is a fence that you need to jump. You do 1.1x10<sup>3</sup> J getting to the top of the fence and finally flopping over it. Calculate the height of the fence. **[2.0m]**
9. A bullet is shot straight up and leaves with a kinetic energy of 1.0x10<sup>3</sup>J. If the bullet is 0.05kg determine it's maximum height above the gun using a conservation of energy approach. **[2.0x10<sup>3</sup>m]**
10. A 1.20x10<sup>3</sup>kg roller coaster rests at the top of a hill 15.0m high. What is the speed at the bottom of the hill assuming no energy losses (use a conservation of energy approach)? **[17.1m/s]**
11. If the actual speed was 15.0m/s calculate the work done by the non-conservative force of friction. **[-4.14x10<sup>4</sup>J]**
12. Calculate the length of the track if the average frictional resistance was 1.10x10<sup>3</sup>N. **[37.6m]**
13. Calculate the heat energy required to raise a 500g sample of water by 4.0°C. Under the same heat energy, what would the temperature change be for a 1.2kg sample? **[8.4x10<sup>3</sup>J, 1.7°C]**