Work and Energy Problems

Name: Date:

- 1. A group of workers are constructing a cement roof. They are using a 215 Hp pump to get the 220,000 liters of water necessary to mix the cement up to the roof 85 m above the ground.
 - a) How much time would it take to get all of the water up to the roof?
 - b) How much potential energy would the water have gained?

2. A member of the US Olympic Ski Team skis down a 1775 m mountain side. What would his maximum velocity be at the bottom of the hill?

- 3. Twenty-eight people with an average weight of 165 pounds get into a rollercoaster train. If the height of the first peak is 135 m, and the train takes 22 seconds to get to the top, calculate the potential energy of the train and passengers assuming that the train has a mass of 2255 Kg.
 - b) What is the minimum horsepower motor necessary to do the job?

- 4. A girl strikes a 350 g tennis ball with a force of 365 N. If her racquet is in contact with the ball for .32 m, what is the velocity of the ball when it leaves the racquet?
 - b) How high above the ground will the ball end up at its peak?
 - c) What is the potential energy of the ball at the peak?
- 5. How much work can 250 kwatthours of electricity do?

6. How much work is required of a stock car engine that accelerates a 2200 kg from 0 to 100 mph in 5.5 seconds? How much horsepower is required?

7. An 72 kg construction worker climbs a 5 m ladder. If he were to fall from the top of that ladder, what would his kinetic energy be when he hit the ground. How fast would he be going at impact?