Math 21B
Vogler
Work Examples

1.) A ball of ice weighing 300 Newtons is raised to a point 50 meters above the ground by a thin chain weighing $\frac{1}{10}$ Newton/meter using a pulley. The ball is lifted toward a heat source and melts at a rate of 5 Newton/meter. Compute the total work required to do this.

2.) A spring has a natural length of 3 feet. A force of 10 pounds will stretch the spring $\frac{2}{3}$ feet.

a.) Find the spring constant k.

b.) How far will a 25 pound weight stretch the spring?

c.) How much work is done stretching the spring 2 feet beyond its natural length?

d.) How much work is done stretching it from 2 feet to 4 feet?

3.) A tank is formed by revolving the graph of $y = x^2$ with $0 \leq x \leq 2$ about the y-axis. If the tank is filled full of water which weighs 62.4 lbs/ft^3, how much work is required to pump all the water out of the top of the tank?