

Written Homework # 2

Math 8 - Winter 2015

Due January 21

1. A rocket is launched from the ground. Because the rocket has multiple stages, the force of the thrusters acting on the rocket is not constant throughout its ascent. The force (in Newtons) is given as a function of the height of the rocket as

$$f(h) = h \sin^2(\pi h/5)$$

where the units of h are hundreds of meters (i.e. $h = 2.5$ is 250 meters). How much work has been done by the thrusters on the rocket once it reaches 1,000 meters? (Note that this problem ignores the force of gravity.)

2. Consider the sequence whose terms are given by

$$a_n = n^2 e^{-n}$$

Answer the following questions (remember to justify your answers!):

- (a) Is the sequence decreasing, increasing or not monotonic?
 - (b) Does the sequence converge? If so, find the limit.
3. Stewart 11.2 # 60