## Math 1512 Exam 3 Take Home

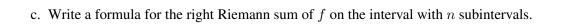
NAME:		

## **INSTRUCTIONS:**

SHOW ALL OF YOUR WORK. Unsupported and illegible answers will not receive credit. Use **proper mathematical notation** to receive full credit. **You are allowed to use a calculator on this test**. However, you cannot consult the internet. May the Force be with you...

- 1. (23 pts) Consider the function  $f(x) = 8 2x^2$  on the interval [0, 2]
  - a. Approximate the net area bounded by the graph of f and x-axis on the interval using a midpoint Riemann sum with n=4.

b. Approximate the net area bounded by the graph of f and x-axis on the interval using a right Riemann sum with n=8.



d. Using the following formula

$$\sum_{k=1}^{n} k^2 = \frac{n(2n+1)(n+1)}{6}$$

evaluate the definite integral  $\int_0^2 f(x) \ dx$  by taking the limit as  $n \to \infty$  of the formula you wrote in part c.

2.	(12 pts) A	softball is	popped up	vertically	from the	ground	with a	velocity	of 30 m/s.

a. Starting with the equation  $a(t) = v'(t) = -9.8 \text{ m/s}^2$ , find the equations for the velocity v(t) and position s(t).

b. Find the time when the object reaches its highest point. What is the height?