

**Math 1314 – ONLINE**  
**Alternate Assignment 12**

Record your answers to these questions on the Alternate Assignment 12 answer sheet and upload your answers to the Alternate 12 slot on the “Assignments” tab at casa.uh.edu. This assignment is due on Saturday, April 13, 2013, at 11:59 p.m. All work must be submitted electronically. Late work will not be accepted.

1. Find:  $\int_{1.8}^{2.9} (4.8x^3 + 9.7x^2 - 6.15x + 12.08) dx$
2. Find the area under the graph of  $f(x) = 6 - x$  from  $x = 1$  to  $x = 4$ .
3. If you are given the rate at which an investment appreciates in value and you find the antiderivative of this, what does the function given by the antiderivative represent?
4. If the marginal cost function is given by  $C'(x) = 12x + 1450$ , where  $x$  is the number of units produced, what is the total additional cost if production is increased from 150 units to 250 units?
5. If a worker can produce items at the rate of  $-t^2 + 12t + 7$  units per hour, where  $t$  represents the number of hours after the worker's shift starts, find the number of units the worker can produce in the 5<sup>th</sup> hour of a 6 hour shift. (Round to the nearest unit.)
6. Suppose velocity is given by  $v(t) = -\frac{1}{2}t^3 + t^2 + 8t + 5$  where  $t$  is measured in seconds and  $v$  is given in feet per second. Find the total distance covered in the four seconds from  $t = 0$  to  $t = 4$ .
7. What is the formula for average value of a function?
8. What is the geometric significance of the average value of a function?
9. Suppose you want to find the average value of  $f(x) = 4x^2 - 9x + 5$  on the interval  $[1.8, 6.7]$ . How would you set up the problem?
10. See problem 9. What is the average value?
11. A company finds that its sales can be approximated by the model  $S(t) = 50e^{0.058t}$  where  $t$  is measured in years since the company opened its doors and  $S$  is given in thousands of dollars. Set up the definite integral you would use to find the average annual sales over the first ten years that the company was in business.
12. See problem 11. Find the company's average annual sales.