

Math Xb Spring 2005
Worksheet: The Area Function

1. Let $f(t) = 3t + 1$.

(a) Find ${}_0A_f(x)$ by considering the area under the graph of $f(t)$.

(b) Find ${}_1A_f$

(c) Find ${}_2A_f$

2. ${}_0A_f(x) = {}_1A_f(x) + \underline{\hspace{2cm}}$. Fill in the blank (use the properties of derivatives to help you), then draw a picture that illustrates the equation

3. Fill in the blank: ${}_aA_f(x) = {}_bA_f(x) + \underline{\hspace{2cm}}$. Does your answer work if $a < b$? Does your answer work if $b < a$?

4. Let $r(t)$ be the rate (in barrels per hour) of oil flowing through an oil pipeline pumping station t hours after noon on a particular day. Describe each of the following expressions and equations in terms of oil flow.

(a) ${}_0A_r(5)$

(b) ${}_2A_r(5)$

(c) ${}_0A_r(x)$

(d) $\frac{{}_0A_r(5)}{5}$

(e) ${}_2A_r(x) = 1000$