MATH 2
PROBLEM OF THE WEEK 6
Due Friday, Feburary 14th, 2003 before the quiz.

Please show all your work!

Name:_____

Say $f(x)$ and $g(x)$ are continuous functions on the interval $[a, b]$, $a < b$. Give geometric arguments for why each of the following are true.

(1) If $f(x) > 0$ for all $x \in [a, b]$ then

$$\int_a^b f(x)\, dx > 0.$$

(2) If $f(x) > g(x)$ for all $x \in [a, b]$, then

$$\int_a^b f(x)\, dx > \int_a^b g(x)\, dx.$$

(3) If $m < f(x) < M$ for two constants m and M and for all $x \in [a, b]$ then

$$m(b - a) < \int_a^b f(x)\, dx < M(b - a).$$