**Mathematics 122**

**Quiz #34** Name: Key

***You must show your work to get full credit.***

2pts (1) Let $b$ be a constant. Show $F(x) = 2bx^3$ is an antiderivative of $f(x) = 6bx^2$.

This means we want to show $F'(x) = f(x)$. But

$F'(x) = (2bx^3)' = 3 \cdot 2bx^2 = 6bx^2 = f(x)$

as required

3pts (2) Compute $\int_0^2 6bx^2\,dx$. 16b

From the fundamental theorem of calculus

$$\int_a^b f(x)\,dx = F(b) - F(a)$$

In our case this becomes

$$\int_0^2 6bx^2\,dx = 2bx^3\Big|_0^2 = 2b(2)^3 - 2b(0)^3$$

$$= 16b$$