University of Utah
Math 1210, Spring 2008
Name: Solutions

Quiz # 5
Time: 15 minutes

Show all work.

Part 1: (4 points) Find *all* antiderivatives of $f(x) = 2x^2 + \cos x + 1$.

We know that $\frac{2}{3}x^3$ is an antiderivative of $2x^2$

$\sin x$ ——— $\cos x$

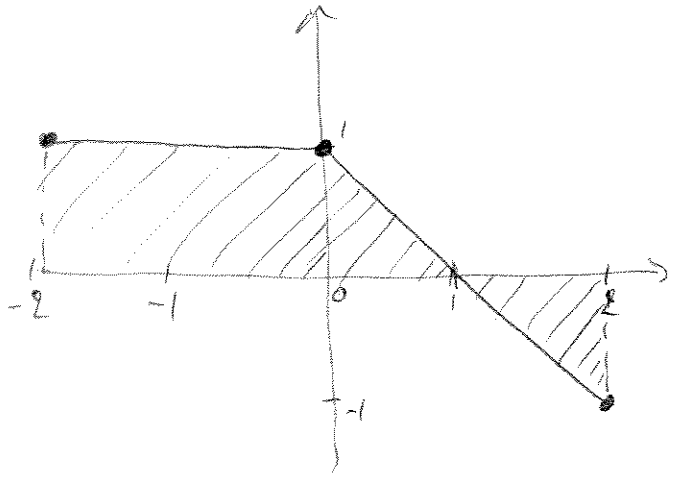
x ——— 1.

Therefore: $F(x) = \frac{2}{3}x^3 + \sin x + x$ is an antiderivative of $f(x)$, and <u>all</u> antiderivatives of $f(x)$ are of the form $F(x) + C$ (C constant

Part 2: (6 points). Consider the function g defined by $g(x) = 1$ if $-2 \le x \le 0$ and $g(x) = 1 - x$ if $0 < x \le 2$. (a) Sketch the graph of g. (b) Evaluate the integral:

$$\int_{-2}^{2} g(x)dx$$

(a)



(b) $\int_{-2}^{2} g(x)dx$ is the "area under the graph of g", more precisely the area of the shaded region, counting negatively the area of the region under the x-axis:

$$\int_{-2}^{2} g(x)dx = 2\times 1 + \frac{1}{2}\times 1\times 1 - \frac{1}{2}1\times 1 = 2$$