14 pts

University of British Columbia
Student Name:

Math 101 Quiz 1

Section 202 - Winter 2014
Instructor: Jose Gonzalez
Date: January 27 / 2014

4pts **(1)** Let

$$f(x) = \int_0^{x^2} \cos(t)\ dt.$$

Find $f'(x)$.

$$f'(x) = \underbrace{\cos(x^2)}_{2\text{pts}} \cdot \underbrace{2x}_{2\text{pts}}$$

6pts **(2)** Compute the following indefinite integral:

$$f(x) = \int \cos(2x)\,(\sin(2x)+1)\ dx.$$

$u = \sin(2x)+1$
$du = 2\cdot\cos(2x)\,dx$

$$f(x) = \frac{1}{2}\int u\,du$$ → Any useful and correctly applied substitution 2pts.

$$= \frac{1}{4}u^2 + C$$ → One correct antiderivative 2pt

$$= \frac{1}{4}(\sin(2x)+1)^2 + C$$ → Antiderivative in terms of variable x 1pt. → Constant 1pt.

4pts **(3)** Evaluate the following definite integral:

$$\int_0^{\pi} \cos(2x)\,(\sin(2x)+1)\,dx = \frac{1}{4}(\sin(2x)+1)^2\Big|_0^{\pi} = \frac{1}{4}(\sin(2\pi)+1)^2 - \frac{1}{4}(\sin(0)+1)^2 = 0 - 0 = 0$$

up to here 2pts/4pts

up to here 3pts/4pts

up to here 4pts/4pts