

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 1 (B)

Question 1. Find the following:

(a) (1 marks) $\frac{d}{dx}(\tan x) = \sec^2 x$

(b) (1 marks) $\frac{d}{dx}(\arctan x) = \frac{1}{1+x^2}$

(c) (1 marks) $\frac{d}{dx}(\cos x) = -\sin x$

(d) (1 marks) $\int \csc x \cot x dx = -\csc x + C$

(e) (1 marks) $\int \cot x dx = \ln|\sin x| + C$

(f) (1 marks) $\int \sec x dx = \ln|\sec x + \tan x| + C$

Question 2. (4 marks) Find the following:

$$\begin{aligned} \int (x+1)^2 \left(1 - \frac{1}{x}\right) dx &= \int (x^2 + 2x + 1) \left(1 - \frac{1}{x}\right) dx \\ &= \int x^2 + 2x + 1 - x - 2 - \frac{1}{x} dx \\ &= \int x^2 dx + \int x dx - \int 1 dx - \int \frac{1}{x} dx \\ &= \frac{x^3}{3} + \frac{x^2}{2} - x - \ln|x| + C \end{aligned}$$