Calculus I Name:_____
TA/classroom:_____ Student ID:_____

Quiz 9

Dec. 19, 2007

Evaluate the given indefinite integrals.
Note: 2 points for each problem and **No Partial Credit**.

1. $\int x\,dx = \frac{1}{2}x^2 + C$

2. For $x \neq 0$, $\int \frac{1}{2x}\,dx = \frac{1}{2}\ln|x| + C$

3. $\int (x+1)^2\,dx = \frac{1}{3}(x+1)^3 + C$

4. $\int e^{4x}\,dx = \frac{1}{4}e^{4x} + C$

5. $\int 3\sqrt[3]{x}\,dx = \frac{9}{4}x^{4/3} + C$

6. $\int e^x + x\,dx = e^x + \frac{1}{2}x^2 + C$

7. $\int 1\,dx = x + C$

8. $\int \cos x\,dx = \sin x + C$

9. $\int \frac{1}{1+x^2}\,dx = \tan^{-1} x + C$

10. For $x \neq 0$, $\int \frac{x^2+1}{x}\,dx = \frac{1}{2}x^2 + \ln|x| + C$

- Derivative formulas
  $\frac{d}{dx}\sin x = \cos x$, $\frac{d}{dx}\cos x = -\sin x$,
  $\frac{d}{dx}\tan^{-1} x = \frac{1}{1+x^2}$, $\frac{d}{dx}\cot^{-1} x = -\frac{1}{1-x^2}$,
  $\frac{d}{dx}e^x = e^x$ $\frac{d}{dx}\ln|x| = \frac{1}{x}$, for $x \neq 0$
- Formulas for indefinite integrals:
  - Let F be any antiderivative of f (i.e. $F'(x) = f(x)$). The **indefinite integral** of $f(x)$ (with respect to x), is defined by
    $$\int f(x)dx = F(x) + c,$$
    where c is an arbitrary constant
  - If $\int f(x)\,dx = F(x) + c$, then for any constant $a \neq 0$, $\int f(ax)\,dx = \frac{1}{a}F(ax) + c$.
  - For $f(x) \neq 0$. $\int \frac{f'(x)}{f(x)}\,dx = \ln|f(x)| + c$,