

Quiz 9

Dec. 19, 2007

Evaluate the given indefinite integrals.

Note: 2 points for each problem and **No Partial Credit**.

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

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

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

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

5. $\int 3\sqrt[3]{x} \, dx =$ _____ $+C$

6. $\int e^x + x \, dx =$ _____ $+C$

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

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

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

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

• Derivative formulas

$$\begin{aligned} \frac{d}{dx} \sin x &= \cos x, \\ \frac{d}{dx} \tan^{-1} x &= \frac{1}{1+x^2}, \\ \frac{d}{dx} e^x &= e^x \end{aligned}$$

$$\begin{aligned} \frac{d}{dx} \cos x &= -\sin x, \\ \frac{d}{dx} \cot^{-1} x &= -\frac{1}{1+x^2}, \\ \frac{d}{dx} \ln |x| &= \frac{1}{x}, \text{ for } x \neq 0 \end{aligned}$$

• 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 $f(x) \neq 0$. $\int \frac{f'(x)}{f(x)} \, dx = \ln |f(x)| + c$,