Differentials:

dx represents the "Differential of x"

To find the Differential of a Function, Find the Derivative, then multiply by the differential of the variable.

Let y = sin x, then dy = cos x dx

Let y = cos 2x, then dy = -sin 2x 2dx

Let $y = 3x^2 + 2x$, then dy = (6x + 2) dx

Antiderivatives:

The symbol for Antidifferentiation of f(x) with respect to x is $\int f(x)\,dx$

$$\frac{d}{dx}ax = a \qquad \int a\,dx = ax + C$$

$$\frac{d}{dx}u^n = nu^{n-1}\,\frac{du}{dx} \qquad \int u^n\,du = \frac{1}{n+1}u^{n+1} + C$$

$$\frac{d}{dx}\sin u = \cos u\,\frac{du}{dx} \qquad \int \cos u\,du = \sin u + C$$

$$\frac{d}{dx}\cos u = -\sin u\,\frac{du}{dx} \qquad \int \sin u\,du = -\cos u + C$$

$$\frac{d}{dx}\tan u = \sec^2 u\,\frac{du}{dx} \qquad \int \sec^2 u\,du = \tan u + C$$

$$\frac{d}{dx}\cot u = -\csc^2 u\,\frac{du}{dx} \qquad \int \csc^2 u\,du = -\cot u + C$$

$$\frac{d}{dx}\sec u = \tan u \sec u\,\frac{du}{dx} \qquad \int \tan u \sec u\,du = \sec u + C$$

$$\frac{d}{dx}\csc u = -\cot u \csc u\,\frac{du}{dx} \qquad \int \cot u \csc u\,du = -\csc u + C$$

$$\frac{d}{dx}e^u = e^u\,\frac{du}{dx} \qquad \int e^u\,du = e^u + C$$

$$\frac{d}{dx}\ln(u) = \frac{1}{u}\frac{du}{dx} \qquad \int \frac{du}{u} = \ln|u| + C$$

Calculus BC 1 Assignment 122 Monday, October 19, 2015 Hour Name

Find the Antiderivatives

1. $\int \cos u \, du =$

2. $\int \sin 2x \, dx =$

3. $\int 4x \cos(3x^2 + 2) \, dx =$

4. $\int \sin^5(3x - 1) \cos(3x - 1) \, dx =$

5. $\int \tan^4(2x + 7) \sec^2(2x + 7) \, dx =$

6. $\int \frac{3}{x} dx =$

7. $\int \cot(8x - 5) \, dx =$ Hint: $\cot x = \frac{\cos x}{\sin x}$

8. $\int 3x\sqrt{x^2 - 7} \, dx =$

9. $\int (3x^2 + 4x - 2)^{15} (3x + 2) \, dx =$

10. $\int \sin(\cos 2x) \sin 2x \, dx =$

11. $\int 2x \sec(3x^2 - 4) \tan(3x^2 - 4) \, dx =$