

## EXPONENTIAL RULE

$$\int e^x dx = e^x + C$$

$$\int e^u du = e^u + C$$

2.  $\int e^{7x+1} dx$

$$u = \underline{7x+1} \quad du = \underline{7} dx$$

$$= \frac{1}{7} \int \underline{7} e^{\underline{7x+1}} dx$$

$$= \frac{1}{7} \int e^u du$$

$$= \frac{1}{7} e^u + C$$

$$= \left( \frac{1}{7} e^{7x+1} + C \right)$$

5.

$$\int (x+2) e^{x^2+4x-1} dx$$

$$u = \underline{x^2+4x-1} \quad du = (2x+4) dx$$

$$du = \underline{2(x+2)} dx$$

$$= \frac{1}{2} \int \underline{2(x+2)} e^{\underline{x^2+4x-1}} dx$$

$$= \frac{1}{2} \int e^u du$$

$$= \frac{1}{2} e^u + C$$

$$= \left( \frac{1}{2} e^{x^2+4x-1} + C \right)$$

1.  $\int \underline{5} e^{\underline{5x}} dx$

$$u = \underline{5x} \quad du = \underline{5} dx$$

$$= \int e^u du$$

$$= e^u + C$$

$$= \left( e^{5x} + C \right)$$

3.  $\int x e^{3x^2+1} dx$

$$u = \underline{3x^2+1} \quad du = \underline{6x} dx$$

$$= \frac{1}{6} \int \underline{6x} e^{\underline{3x^2+1}} dx$$

$$= \frac{1}{6} \int e^u du$$

$$= \frac{1}{6} e^u + C$$

$$= \left( \frac{1}{6} e^{3x^2+1} + C \right)$$

4.  $\int 8x^2 e^{4x^3} dx$

$$u = \underline{4x^3} \quad du = \underline{12x^2} dx$$

$$= 8 \cdot \frac{1}{12} \int \underline{12x^2} e^{\underline{4x^3}} dx$$

$$= \frac{8}{12} \int e^u du$$

$$= \frac{2}{3} e^u + C$$

$$= \left( \frac{2}{3} e^{4x^3} + C \right)$$

## u-SUBSTITUTION

①  $(u)^{\text{power}}$

②  $\sqrt{u}$

③  $e^u$

④  $\frac{?}{u}$