

HW Review.

$$\int (e+\pi) x^{e+\pi} dx$$

$$\frac{(e+\pi)x^{e+\pi+1}}{e+\pi+1} + C$$

$$\begin{aligned} * \int x^n dx \\ = \frac{x^{n+1}}{n+1} + C \end{aligned}$$

$$\begin{aligned} * \int 2x^3 dx \\ \frac{2x^4}{4} + C \end{aligned}$$

$$\int \pi x^e + e x^\pi dx$$
$$= \frac{\pi x^{e+1}}{e+1} + \frac{e x^{\pi+1}}{\pi+1} + C$$

$$\frac{d}{dx} \left( (x^2 - 3)^5 \right) = 5 (x^2 - 3)^4 \cdot \underline{2x}$$

$$\int \underline{2x} (x^2 - 3)^4 \underline{dx}$$

u-sub

$$u = \underline{x^2 - 3}$$

$$\frac{du}{dx} = 2x$$

$$du = \underline{2x dx}$$

$$= \int u^4 du$$

$$= \frac{u^5}{5} + c$$

$$= \frac{(x^2 - 3)^5}{5} + c$$

$$\int 3x^2 \sin(x^3) dx$$

$$= \int \sin(u) du$$

$$= -\cos(u) + C$$

$$= -\cos(x^3) + C$$

$$u = x^3$$

$$\frac{du}{dx} = 3x^2$$

$$du = 3x^2 dx$$

$$\int \sqrt{3x+1} dx$$

$$= \frac{1}{3} \int \sqrt{u} du$$

$$= \frac{1}{3} \int (u)^{1/2} du$$

$$= \frac{1}{3} \cdot \frac{2}{3} u^{3/2} + C$$

$$= \frac{2}{9} (3x+1)^{3/2} + C$$

$$u = 3x+1$$

$$\frac{du}{dx} = 3$$

$$du = 3dx$$

$$\frac{du}{3} = dx$$

$$\int x e^{x^2} dx$$

$$\left(\frac{1}{2}\right) \int e^u du$$

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

$$\frac{1}{2} e^{x^2} + C$$

$$u = x^2$$

$$du = 2x dx$$

$$\frac{du}{2} = x dx$$