

Use the given substitution to e

$$\int x^2 \sqrt{x^3 + 4} dx, u = x^3 + 4$$

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

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

$$u = x^3 + 4 \quad = \frac{2}{9} (x^3 + 4)^{3/2} + C$$

Substitution

$$u = x^3 + 4$$

$$du = 3x^2 dx$$

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

Evaluate $\int_0^5 \frac{8}{(x^2 + 4)^2} dx.$

$$= \int_{u=4}^{29} \frac{8}{u^2} \frac{du}{2}$$

$$u = x^2 + 4$$

$$u(0) = 0 + 4$$

$$du = 2x dx$$

$$u(5) = 25 + 4 = 29$$

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

$$\frac{8}{2} \int_4^{29} u^{-2} du$$

$$-4 \left(\frac{1}{29} - \frac{1}{4} \right) = 4 \frac{u^{-1}}{-1} \Big|_4^{29}$$

Evaluate the given integral.

$$\int_{-24}^{24} x e^{-2x^2} dx$$

Your Answer:

$$= \int_{-576}^{-576} e^u \frac{du}{-4} = 0$$

$u = -2x^2$
 $du = -4x dx$
 $u(24) = -20$
 $u(-24) = -$