

B 1. Evaluate:  $\int x^2 \sin(x^3) dx$

$$\frac{1}{3} \int \sin u du = -\frac{1}{3} \cos u + C$$

A)  $-\frac{x^3}{3} \cos\left(\frac{x^4}{4}\right) + C$

B)  $-\frac{1}{3} \cos(x^3) + C$

C)  $\frac{1}{3} \cos(x^3) + C$

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

E)  $-\frac{1}{3} \sin(x^3) + C$

$u = x^3 \quad du = 3x^2 dx \quad \frac{1}{3} du = x^2 dx$

D 2. Evaluate:  $\int_{x=1}^3 \frac{x}{x^2+1} dx$

A)  $\ln 5$

$$\frac{1}{2} \int_{u=2}^{u=10} \frac{1}{u} du = \frac{1}{2} \ln|u| \Big|_2^{10} = \frac{1}{2} \ln 10 - \frac{1}{2} \ln 2$$

B)  $\ln 10$

C)  $2 \ln 2$

D)  $\frac{1}{2} \ln 5$

E)  $\ln\left(\frac{5}{2}\right)$

$u = x^2 + 1$   
 $u(3) = 10 \quad u(1) = 2$   
 $\frac{1}{2} (\ln 10 - \ln 2)$   
 $\frac{1}{2} (\ln(\frac{10}{2}))$   
 $\frac{1}{2} \ln 5$

3. Evaluate the given integral.  $\int \frac{x^2 - 2x + 3}{x+1} dx$

$$\begin{array}{r} -1 \quad | \quad 1 \quad -2 \quad | \quad 3 \\ \hline 1 \quad -3 \quad | \quad 6 \end{array}$$

$$= \int \left(x - 3 + \frac{6}{x+1}\right) dx$$

$$= \frac{x^2}{2} - 3x + 6 \ln|x+1| + C$$