AP MC Opener 7.2 Name_____

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

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

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

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

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

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

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

$\frac{1}{3}\int \sin u\, du$

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

2. Evaluate: $\int_1^3 \frac{x}{x^2+1}dx$

$u = x^2+1 \quad \frac{du}{dx} = 2x \quad \frac{1}{2}du = x\,dx \quad u(1)=2 \quad u(3)=10$

A) $\ln 5$

B) $\ln 10$

C) $2\ln 2$

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

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

$\frac{1}{2}\int_2^{10} \frac{1}{u}du = \frac{1}{2}(\ln 10 - \ln 2)$

$= \frac{1}{2}\ln 5$