MATH 155/MYERS
QUIZ 2/INTEGRATION BY PARTS/2 POINTS POSSIBLE 4

Name Key

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate the integral.

1) $\int x \csc^2 3x \, dx$ $= -\frac{1}{3}x\cot 3x + \int \frac{1}{3}\cot 3x \, dx$

$\int x\csc^2 3x\,dx = -\frac{1}{3}x\cot 3x + \frac{1}{3}\int \cot u \frac{dw}{3}$

$\int x\csc^2 3x\,dx = -\frac{1}{3}x\cot 3x + \frac{1}{9}\ln|\sin u| + C$

$\int x\csc^2 3x\,dx = -\frac{1}{3}\cot 3x + \frac{1}{9}\ln|\sin 3x| + C$

$u = x$
$du = dx$
$\int dv = \int \csc^2 3x\,dx$
$v = -\frac{1}{3}\cot 3x$

$w = 3x$
$\frac{dw}{dx} = 3$
$dx = \frac{dw}{3}$

1) C → 2 pts
D → 1 pt

A) $\frac{1}{3}x\cot 3x - \frac{1}{9}\ln|\sin 3x| + C$

B) $-3x\cot 3x + 9\ln|\sin 3x| + C$

C) $-\frac{1}{3}x\cot 3x + \frac{1}{9}\ln|\sin 3x| + C$

D) $-x\cot 3x + \ln|\sin 3x| + C$

2) $\int \cos^{-1} x \, dx$

$\int \arccos x\,dx = x\arccos x - \int x\left(-\frac{1}{\sqrt{1-x^2}}dx\right)$

$\int \arccos x\,dx = x\arccos x + \int x(1-x^2)^{-1/2}\,dx$

$\int \arccos x\,dx = x\arccos x + \int x u^{-1/2}\frac{dw}{-2x}$

$\int \arccos x\,dx = x\arccos x - \frac{1}{2}\frac{u^{1/2}}{1/2} + C$

$\int \arccos x\,dx = x\arccos x - \sqrt{1-x^2} + C$

$\frac{d}{dx}u = \frac{d}{dx}\arccos x$
$du = -\frac{1}{\sqrt{1-x^2}}dx$

$\int dv = \int dx$
$v = x$

$w = 1-x^2$
$\frac{dw}{dx} = -2x$
$dx = \frac{dw}{-2x}$

2) D → 2 pts
C → 1 pt

A) $x\cos^{-1}x - 2\sqrt{1-x^2} + C$

B) $x\cos^{-1}x - \frac{1}{\sqrt{1-x^2}} + C$

C) $x\cos^{-1}x + \sqrt{1-x^2} + C$

D) $x\cos^{-1}x - \sqrt{1-x^2} + C$