Math 202 – Quiz # 1b
(Review for integration)

Name: __Solution__ Sec. _____ ID: _____

Evaluate each one of the given integrals

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1. $\int 10xe^x\,dx$

$= 10\int x\,e^x\,dx$ [Integrating by Parts]

Let $u = x$, $dv = e^x\,dx$

$du = dx$, $v = e^x$

$\int u\,dv = uv - \int v\,du$

$\Rightarrow \int xe^x\,dx = xe^x - \int e^x\,dx = xe^x - e^x$

$\therefore \int 10xe^x\,dx = 10(xe^x - e^x) + C$

$= 10\,e^x(x-1) + C$

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

$\frac{1}{(1-x)(1+x)} = \frac{A}{1-x} + \frac{B}{1+x} = \frac{A(1+x) + B(1-x)}{(1-x)(1+x)}$

$A(1+x) + B(1-x) = 1$

$x=1 \Rightarrow A = \frac{1}{2}$
$x=-\frac{1}{2} \Rightarrow B = \frac{1}{2}$

$\int \frac{dx}{1-x^2} = \int \left[\frac{\frac{1}{2}}{1-x} + \frac{\frac{1}{2}}{1+x}\right]dx = \frac{1}{2}\int \left[\frac{1}{1-x} + \frac{1}{1+x}\right]dx$

$= \frac{1}{2}\left[\ln|1-x| + \ln|1+x|\right] + C$

$= \frac{1}{2}\ln\left|\frac{1+x}{1-x}\right| + C$

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2. $\int \csc^2 5\theta\,d\theta$

$= -\frac{1}{5}\cot 5\theta + C$

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4. $\int \frac{dt}{t^2+1}$

$= \tan^{-1}t + C$