

Math 202 – Quiz # 1b

(Review for integration)

Name: Solution

Sec. _____

ID: _____

Evaluate each one of the given integrals

$\int \csc^2 7\theta d\theta$ $= -\frac{1}{7} \cot 7\theta + C$	<p>3. $\int \frac{dx}{1-x^2} = \int \frac{1}{(1-x)(1+x)} dx$</p> $\frac{1}{(1-x)(1+x)} = \frac{A}{1-x} + \frac{B}{1+x} = \frac{A(1+x)+B(1-x)}{(1-x)(1+x)}$ $A(1+x)+B(1-x) = 1$ $\begin{aligned} x=1 &\Rightarrow A=\frac{1}{2} \\ x=-1 &\Rightarrow B=\frac{1}{2} \end{aligned}$ $\int \frac{dx}{1-x^2} = \int \left(\frac{\frac{1}{2}}{1-x} + \frac{\frac{1}{2}}{1+x} \right) dx = \frac{1}{2} \int \left(\frac{1}{1-x} + \frac{1}{1+x} \right) dx$ $= \frac{1}{2} [\ln 1-x + \ln 1+x] + C$ $= \frac{1}{2} \ln 1-x^2 + C$
<p>2. $\int 2xe^x dx$</p> $= 2 \int xe^x dx$ <p>let $u = x$, $dv = e^x dx$ $du = dx$, $v = e^x$</p> $\int u dv = uv - \int v du$ $\Rightarrow \int xe^x dx = xe^x - \int e^x dx$ $= xe^x - e^x + C$ $\therefore \int 2xe^x dx = 2(xe^x - e^x) + C$ $= 2e^x(x-1) + C$	<p>4. $\int \frac{du}{u^2+1}$</p> $= \tan^{-1} u + C$