

Math 260 – Quiz # 1b

(Review for integration)

Name: _____

Solution

ID. _____

Sr.#: _____

Evaluate each one of the given integrals

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