

Math 202 – Quiz # 1b

(Review for integration)

Name: Solution

Sec. _____

ID: _____

Evaluate each one of the given integrals

<p>1. $\int 10xe^x dx$</p> <p>$= 10 \int x e^x dx$ [integrating by parts]</p> <p>let $u = x$, $dv = e^x dx$</p> <p>$du = dx$, $v = e^x$</p> <p>$\int u dv = uv - \int v du$</p> <p>$\Rightarrow \int x e^x dx = x e^x - \int e^x dx = x e^x - e^x$</p> <p>$\therefore \int 10 x e^x dx = 10(x e^x - e^x) + C$</p> <p>$= 10 e^x (x - 1) + C$</p>	<p>3. $\int \frac{dx}{1-x^2} = \int \frac{1}{(1-x)(1+x)} dx$</p> <p>$\frac{1}{(1-x)(1+x)} = \frac{A}{1-x} + \frac{B}{1+x} = \frac{A(1+x) + B(1-x)}{(1-x)(1+x)}$</p> <p>$A(1+x) + B(1-x) = 1$</p> <p>$x=1 \Rightarrow A = \frac{1}{2}$</p> <p>$x=-1 \Rightarrow B = \frac{1}{2}$</p> <p>$\int \frac{dx}{1-x^2} = \int \left[\frac{\frac{1}{2}}{1-x} + \frac{\frac{1}{2}}{1+x} \right] dx = \frac{1}{2} \int \left[\frac{1}{1-x} + \frac{1}{1+x} \right] dx$</p> <p>$= \frac{1}{2} [\ln 1-x + \ln 1+x] + C$</p> <p>$= \frac{1}{2} \ln 1-x^2 + C$</p>
<p>2. $\int \csc^2 5\theta d\theta$</p> <p>$= -\frac{1}{5} \cot 5\theta + C$</p>	<p>4. $\int \frac{dt}{t^2+1}$</p> <p>$= \tan^{-1} t + C$</p>