MATH 205 – Calculus I **SQ 5.5**

Name: Nathan Shallan Date: 12/09/2020

To receive any credit for the following problems, you must show complete and accurate work. Use proper limit notation and give exact answers unless otherwise noted.

1. Determine $\int(2x^2e^{x^3+5})dx$ $\Rightarrow \int \frac{2}{3}e^u du$

let $u = x^3+5$

$du = 3x^2dx$ $\Rightarrow \frac{2}{3}e^{(x^3+5)}+C$

$\frac{2}{3}du = 2x^2dx$

2. Evaluate $\int_0^{\frac{\pi}{2}} 4\cos^3 x \sin x\, dx$ $\Rightarrow \int_1^0 4u^3(-du)$

let $u = \cos x$

$du = -\sin x$

$-du = \sin x$

$x=0 : u=1$

$x=\pi/2 : u=0$

$\int_0^1 4u^3(-du)$

$-\int_0^1 4u^3(-du)$

$u^4\Big|_0^1$

$1-0$

1

$$\int_0^{\pi/2}(4\cos^3 x \sin x)dx = 1$$