Math 1210: Quiz #10 **Fall 2017**

Name: **Solution**	A#:	Section:

[5] 1. $\int (6x^2 - 1)\sqrt{2x^3 - x + 1}\,dx$

$u = 2x^3 - x + 1$

$du = (6x^2 - 1)\,dx$

$= \int \sqrt{u}\,du$

$= \int u^{1/2}\,du = \frac{2}{3}u^{\frac{3}{2}} + C$

[5] 2. $\int \sec^2(x)e^{\tan(x)}dx$

$u = \tan(x)$

$du = \sec^2(x)\,dx$

$= \int e^u\,du$

$= e^u + C = e^{\tan(x)} + C$

[5] 3. $\int_1^e \frac{\ln(x)}{x} dx$

$u = \ln x$

$du = \frac{1}{x} dx$

$x = e \Rightarrow u = \ln e = 1$

$x = 1 \Rightarrow u = \ln 1 = 0$

$= \int_0^1 u \, du$

$= \frac{1}{2} u^2 \Big|_0^1 = \frac{1}{2} - 0 = \frac{1}{2}$

[5] 4. $\int_0^{\frac{\pi}{4}} \sin(x) \sec^8(x) dx$

$u = \sec(x)$

$du = \tan(x) \sec(x) dx = \sin(x) \sec^2(x) dx$

$x = \frac{\pi}{4} \Rightarrow u = \sec\left(\frac{\pi}{4}\right) = \sqrt{2}$

$x = 0 \Rightarrow u = \sec(0) = 1$

$= \int_1^{\sqrt{2}} u^6 \, du$

$= \frac{1}{7} u^7 \Big|_1^{\sqrt{2}} = \frac{(\sqrt{2})^7}{7} - \frac{1}{7} = \frac{1}{7}(8\sqrt{2} - 1)$

$= \int_1^{\frac{1}{\sqrt{2}}} -u^{-8} \, du = \frac{1}{7} u^{-7} \Big|_1^{\frac{1}{\sqrt{2}}} = \frac{1}{7}(8\sqrt{2} - 1)$

$u = \cos(x)$

$du = -\sin(x) dx$

$x = \frac{\pi}{4} \Rightarrow u = \cos\left(\frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$

$x = 0 \Rightarrow u = \cos(0) = 1$