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

Name: Solution	A#:	Section:

[5] 1. $\int (2x+1)(x^2+x+2)^{17}dx$

$$\begin{cases} \text{let } u = x^2+x+2 \\ du = (2x+1)\,dx \end{cases}$$

$$= \int u^{17}\,du$$

$$= \frac{u^{18}}{18} + C$$

$$= \frac{1}{18}(x^2+x+2)^{18} + C$$

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

let $u = \tan x$

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

$$= \int e^u\,du$$

$$= e^u + C$$

$$= e^{\tan x} + C$$

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

$$\begin{cases} \text{let } u = \ln x \\ du = \frac{1}{x} dx \end{cases}$$

$$\begin{cases} x = 1 \to u = \ln 1 = 0 \\ x = e \to u = \ln e = 1 \end{cases}$$

$= \int_0^1 u \, du$

$= \left[\frac{u^2}{2} \right]_0^1$

$= \frac{1}{2} \left[u^2 \right]_0^1$

$= \frac{1}{2} (1^2 - 0)$

$= \boxed{\frac{1}{2}}$

[5] 4. $\int_0^{\frac{\pi}{2}} \frac{\cos(x)}{\sin(x) + 1} dx$

$$\begin{cases} \text{let } u = \sin x + 1 \\ du = \cos x \, dx \end{cases}$$

$$\begin{cases} x = 0 \to u = \sin(0) + 1 = 1 \\ x = \frac{\pi}{2} \to u = \sin \frac{\pi}{2} + 1 = 2 \end{cases}$$

$\int_1^2 \frac{1}{u} du$

$= \ln |u| \Big]_1^2$

$= \ln 2 - \ln 1$

$= \boxed{\ln 2}$

v10.AB