Calculus BM
Instructor: Yu-Ling Tseng Quiz 4 20180103

⋆ Answer and mark clearly the questions in the provided answer sheets.
Write down your name and student's ID on the each answer sheet you used.
∗ **Note:** No points will be given if no arguments are provided for an answer.
For your information:

- $\int \sin u \, du = -\cos u + C$
- $\int \cos u \, du = \sin u + C$
- $\int \sec^2 u \, du = \tan u + C$
- $\int \sec u \, \tan u \, du = \sec u + C$
- $\sin^2 u + \cos^2 u = 1$ and $\tan^2 u + 1 = \sec^2 u$

Good Luck! $\sim\sim$ *Yes* ◡̈

1. (10 points) Find the average value of

$$f(x) = \frac{3}{x+2}$$

on the interval $[1, 5]$, then find the x-value in the interval for which the function is equal to its average value.

2. (90 points) Find

(a) $\displaystyle\int_0^1 e^{2x}\sqrt{e^{2x}+1}\, dx$ (b) $\displaystyle\int_2^8 |3x-9|\, dx$ (c) $\displaystyle\int_1^e x^5 \ln x \, dx$

(d) $\displaystyle\int_1^2 x^2 e^{2x}\, dx$ (e) $\displaystyle\int_0^8 x\sqrt{x+1}\, dx$ (f) $\displaystyle\int \frac{xe^{2x}}{(2x+1)^2}\, dx$

(g) $\displaystyle\int \frac{x}{x^4-36}\, dx$ (h) $\displaystyle\int \sqrt{3+x^2}\, dx$ (i) $\displaystyle\int 6x \sec^2 x \, dx$