Calculus BIM
Instructor: Yu-Ling Tseng   Quiz 3   20201221

$\star$ 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* ⌣

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1. (60 points) Find

$$(a) \ \int 5x \sqrt[3]{1 - x^2} \, dx \qquad (b) \ \int \frac{5}{e^{-5x} + 7} \, dx \qquad (c) \ \int \frac{x}{\sqrt{x - 1}} \, dx$$

$$(d) \ \int \frac{e^{-x}}{1 - e^{-x}} \, dx \qquad (e) \ \int t \ln(t + 1) \, dt \qquad (f) \ \int x^2 (\ln x)^3 \, dx$$

2. (10 points) Find $f(x)$ whose graph passes through the point $(0, 7)$, and

$$f'(x) = -3x^2 (2 - x^3)^4.$$

3. (10 points) Find a function f that satisfies the differential equation and the initial conditions: $f''(x) = 2$, $f'(2) = 5$, $f(2) = 10$.

4. (20 points) Find

$$(a) \ \int (\sin x + \cos x)^2 \, dx \qquad (b) \ \int 6x \sec^2(x) \, dx$$