Dawson College: **Calculus II** (SCIENCE): 201-NYB-05-S3: Winter 2023: **Quiz 2** name: Y. Lamontagne

Books, watches, notes or cell phones are **not** allowed. The **only** calculators allowed are the Sharp EL-531**. You **must** show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

Question 1. *(1 mark each)* Integrate the following indefinite integrals:

a.

$$\int \frac{1}{x^{1/5}}\,dx = \int x^{-1/5}\,dx = \frac{x^{-1/5+1}}{-1/5+1} + C = \frac{5}{4}x^{4/5} + C$$

b.

$$\int \csc x\,dx = -\ln|\csc x + \cot x| + C$$

c.

$$\int \tan x\,dx = -\ln|\cos x| + C$$

d.

$$\int \frac{1}{\sqrt{13-x^2}}\,dx = \int \frac{1}{\sqrt{(\sqrt{13})^2-x^2}}\,dx = \arcsin\frac{x}{\sqrt{13}} + C$$

e.

$$\int e^x\,dx = e^x + C$$

f.

$$\int \cos x\,dx = \sin x + C$$

Question 2. *(4 marks)* Find f.

$f''(t) = 3\cos t + 2\sin t \quad f(0) = 0,\ f(\pi) = 0$

$$f'(t) = \int f''(t)\,dt = \int 3\cos t + 2\sin t\,dt = 3\sin t - 2\cos t + C$$

$$f(t) = \int f'(t)\,dt = \int 3\sin t - 2\cos t + C\,dt = -3\cos t - 2\sin t + Ct + D$$

$0 = f(0)$

$0 = -3\cos(0) - 2\sin(0) + C(0) + D$

$3 = D$

$0 = f(\pi)$

$0 = -3\cos(\pi) - 2\sin(\pi) + C(\pi) + 3$

$0 = 3 - 0 + C\pi + 3$

$C = \frac{6}{\pi}$

$\therefore f(t) = -3\cos t - 2\sin t + \frac{6}{\pi}t + 3$