Dawson College: **Calculus II** (SCIENCE): 201-NYB-05-S3: Winter 2023: **Quiz 1** 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)* Differentiate the following functions:

a. $f(x) = \frac{1}{x^{3/8}} = x^{-3/8}$ $\quad f'(x) = \frac{-3}{8} x^{-3/8-1} = \frac{-3}{8} x^{\frac{-11}{8}}$

b. $f(x) = \operatorname{arccot} x$ $\quad f'(x) = \frac{-1}{1+x^2}$

c. $f(x) = \tan x$ $\quad f'(x) = \sec^2 x$

d. $f(x) = e^x$ $\quad f'(x) = e^x$

e. $f(x) = \csc x$ $\quad f'(x) = -\csc x \cot x$

f. $f(x) = \arcsin x$ $\quad f'(x) = \frac{1}{\sqrt{1-x^2}}$

Question 2. *(2 marks)* Differentiate the following functions *(do not simplify)*:

$f(x) = (x)\sec(\arctan 3x)$

$f'(x) = \sec(\arctan 3x) + x \sec(\arctan 3x)\tan(\arctan 3x) \frac{1}{1+(3x)^2} \cdot 3$

Question 3. *(2 marks)* Differentiate the following functions *(do not simplify)*:

$f(x) = \frac{e^{5x}}{\cos 3x}$

$f'(x) = \frac{e^{5x} \cdot 5\cos 3x - e^{5x}(-\sin(3x)) \cdot 3}{(\cos 3x)^2}$