

**Quiz 1, Math 246, Professor David Levermore
Tuesday, 3 September 2019**

Your Name:

Discussion Instructor (circle one): Sam Potter Nathan Yu David Russell
Discussion Time (circle one): 9:00 11:00 12:00

**No books, notes, calculators, or any electronic devices.
Show your reasoning for full credit. Good luck!**

- (1) [2] What is the interval of definition for the solution of the initial-value problem

$$\frac{dw}{dz} + \frac{e^z}{z^2 - 25} w = \frac{\sin(z)}{z^2 - 4}, \quad w(-3) = 7.$$

(You do not need to solve the differential equation, but you must give your reasoning!)

- (2) [4] Solve the initial-value problem

$$(1 + t^2) \frac{dv}{dt} + 2tv = 8t^3, \quad v(0) = 3.$$

- (3) [4] Find an implicit solution of the initial-value problem

$$\frac{dy}{dx} = e^x \frac{y^2 - 9}{2y}, \quad y(0) = -5.$$