Quiz 1, Math 246, Professor David Levermore
Tuesday, 4 September 2018

Your Name:

Discussion Instructor (circle one): Sid Sharma Anqi Ye
Discussion Time (circle one): 8:00 9:00 10:00

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

$$\frac{\mathrm{d}v}{\mathrm{d}z} + \frac{\sin(z)}{z^2-9}\,v = \frac{\cos(z)}{z^2-25}\,, \qquad v(-4) = 2\,.$$

(You do not need to solve the differential equation to answer this question!)

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

$$t\,\frac{\mathrm{d}u}{\mathrm{d}t} + 4u = 6t^2\,, \qquad u(1) = 3\,.$$

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

$$\frac{\mathrm{d}y}{\mathrm{d}x} = -\frac{e^x}{2y}\,, \qquad y(0) = -2\,.$$