

Quiz 11, Math 246, Professor David Levermore
Tuesday, 4 December 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) [5] Consider the system

$$x' = -2x + y, \quad y' = 5x + 2y - 3x^2.$$

- (a) [2] Find all of its stationary points.
- (b) [3] Find a nonconstant function $H(x, y)$ such that every orbit of this system satisfies $H(x, y) = c$ for some constant c .

(2) [5] Consider the system

$$p' = 3p - q, \quad q' = 5p + 5q - 10p^2.$$

Its stationary points are $(0, 0)$ and $(2, 6)$. Classify the type and stability of each of these stationary points. (You do not have to sketch anything.)