

## Assignment #16

Due on Friday, April 19, 2019

**Read** Section 5.4, on *The Flow of TwoDimensional Linear Fields*, in the class lecture notes at <http://pages.pomona.edu/~ajr04747/>

**Do** the following problems

In problems (1)–(5), for the given the two–dimensional, linear system, (a) compute and sketch line–solutions, if any; (b) sketch the nullclines; (c) sketch the phase portrait; and (d) describe the nature of the stability, or unstability, of the origin.

$$1. \begin{cases} \dot{x} = -2y; \\ \dot{y} = x - 3y. \end{cases}$$

$$2. \begin{cases} \dot{x} = -y; \\ \dot{y} = x + 2y. \end{cases}$$

$$3. \begin{cases} \dot{x} = -x + 4y; \\ \dot{y} = -2x + 3y. \end{cases}$$

$$4. \begin{cases} \dot{x} = y; \\ \dot{y} = -4x. \end{cases}$$

$$5. \begin{cases} \dot{x} = -3x + 5y; \\ \dot{y} = -2x + 3y. \end{cases}$$