# Math 6345 Advanced ODEs
# Homework 5

1. Given the systems

$$\begin{aligned}
&(i) && \dot{x} = -y - x^3, && \dot{y} = x - y^3,\\
&(ii) && \dot{x} = -x - 2y^2, && \dot{y} = xy - y^3,\\
&(iii) && \dot{x} = 2x + x^3 + 2x^2y + y^3, && \dot{y} = x + x^2y + y^3,
\end{aligned}$$

determine all critical points and classify them.

Hint: On (iii) try $V = x^2 + axy + by^2$

Due. Tues. Nov 3, 2020