Problems 6.16, 6.18, 6.20, 7.5

**Problem 5.B**

Shown that the system is stable at 0 by finding an appropriate Liapunov function

\[
\begin{align*}
\dot{x} &= -x + 2y^3 - 2y^4 \\
\dot{y} &= -x - y + xy
\end{align*}
\]

**Problem 5.C**

Use Liapunov function type argument to show that the nonautonomous system is asymptotically stable at 0 (focus on cases when \( t_0 > 0 \)):

\[
\begin{align*}
\dot{x} &= y \\
\dot{y} &= -x - ty
\end{align*}
\]