HOMEWORK DAY 35 – *Modeling with Differential Equations §9.1*

1. Show that $y = \sqrt{1 - x^2}$ solves the differential equation $yy' + x = 0$.

2. Show that $y = \ln x$ solves the differential equation $xy'' + y' = 0$.

3. §9.1: 21 (for what values of P is population increasing/decreasing/at equilibrium?)

4. §9.1: 23 (explain why given functions can't be solutions to given ode)

5. Find the solution to the initial value problem $\dfrac{dy}{dx} = \dfrac{1}{4 + x^2}$, $y(2) = 1$

6. Write the solution to the initial value problem $\dfrac{dy}{dx} = e^{-x^2}$, $y(5) = 0$ in integral form.