

3. (5 points) Solve $\frac{\arctan(y)}{x^2} \frac{dy}{dx} = \frac{1+y^2}{e^x}$ if $y(1) = 1$. Indicate how to find the antiderivatives in your work. Your final answer may be an implicit solution if you wish.

4. (5 points) The following slope field is for a first order ordinary differential equation with solution equal to the function $y(x)$ for each given initial condition. The differential equation satisfies the Existence-Uniqueness theorem which means no two different solutions can cross. Use this information to sketch and label an estimate of two solutions: one for which $y(0) = 2$ and the other for $y(4) = -2$.

