Meeting 2 Worksheet (6/28/22)

1. Find the general solution to the following differential equations using the method of integrating factors:

   (a) $ty' - y = t^2 e^t$

   (b) $(1 + t^2)y' + 4ty = (1 + t^2)^{-2}$.

2. Consider the following initial value problem: $y' - \frac{1}{2}y = 2\cos t$ with $y(0) = a$.

   (a) Use this GeoGebra tool to plot a direction field and several solution curves. (Don't try to do this part by hand!)

   (b) Notice that the end behavior (as $t \to \infty$) depend on a. Try to estimate the value of a for which the transition in end behavior occurs.

   (c) Solve the initial value problem using integrating factors. Find the exact value of a from part(b).