Worksheet week 7 - MAC 2312, Spring 2014 **NAME:** _____

1. Compute $\int_0^1 x \arctan x \, dx$

2. (a) Find the general formula for $\int e^{at} \cos(bt) \, dt$ where a, b are arbitrary constants.

(b) Apply the formula you found in part (a) to the following electrical engineering problem.
The charge in an LRC circuit varies according to $q'(t) = e^{-0.2t} \cos(3t)$ Coulombs per second. Determine a formula for $q(t)$, assuming the charge on the capacitor is initially $q(0) = 1$.