Math 344 Quiz 1

Names: _____

1. Let $J(t) = \mathcal{L}^{-1}\left[\frac{1}{\sqrt{s^2+1}}\right]$. Simplify $J(t) * J(t)$.

2. Simplify $t^n * t^m$ where n and m are positive integers.

3. Simplify $\delta(t-a) * f(t)$.

4. Find $\mathcal{L}^{-1}\left[e^{-as}\arctan(b/(s+c))\right]$.

5 (Bonus! Only try when done with other exercises). Suppose $f(t)$ is periodic with period p, meaning that $f(t+p) = f(t)$. Show that $\mathcal{L}[f(t)] = \dfrac{1}{1-e^{-ps}}\displaystyle\int_0^p f(t)e^{-st}\,dt$.