

Quiz 7, Math 246, Professor David Levermore
Tuesday, 29 October 2019

Your Name:

Discussion Instructor (circle one): Sam Potter Nathan Yu David Russell
Discussion Time (circle one): 9:00 11:00 12:00

No books, notes, calculators, or any electronic devices.
Show your reasoning for full credit. Good luck!

Short Table: $\mathcal{L}[t^n e^{at}](s) = \frac{n!}{(s-a)^{n+1}}$ for $s > a$, $\mathcal{L}[u(t-c)j(t-c)](s) = e^{-cs}\mathcal{L}[j](s)$.

- (1) [4] Use the definition of the Laplace transform to compute $\mathcal{L}[f](s)$ for the function $f(t) = u(t-3)e^{-2t}$, where u is the unit step function.

- (2) [3] Find the Laplace transform $X(s)$ of the solution $x(t)$ of the initial-value problem

$$x'' + 16x = 0, \quad x(0) = 3, \quad x'(0) = -5.$$

DO NOT solve for $x(t)$, just $X(s)$!

- (3) [3] Find $y(t) = \mathcal{L}^{-1}[Y](t)$ where $Y(s) = e^{-3s} \frac{24}{(s-4)(s+2)}$.