

Quiz 6, Math 244

INSTRUCTION:

This is a “re-take” of the in-class quiz. Write up the solutions to the following questions, and turn them in for a weighted average overall for Quiz 6. If you were not present on Thursday, you may do this for a maximum of 80% overall. On the other hand, if you did well in class, you do not need to turn this in (I’ll simply count the score as usual).

DUE: Monday at noon. Turn in your solutions either Friday in class or turn it in at my office by Monday noon- I will leave an envelope just outside my office door.

1. Use the *definition* of the Laplace transform to compute $\mathcal{L}(t^2)$.

You may use the fact (without proof) that t^n/e^{st} goes to zero as $t \rightarrow \infty$ if $s > 0$.

2. Are the following functions of exponential order (use the definition to answer)?

You may use the fact (without proof) that $\ln(t) < t$ if $t > 0$.

(a) $f(t) = t^t$

(b) $f(t) = t^3$

3. Find the inverse Laplace transform of $\frac{1-2s}{s^2+4s+5}$

4. Define $Y(s) = \mathcal{L}(y(t))$. Given the IVP below, solve for $Y(s)$.

(Do NOT invert the transform for $y(t)$, just find an expression for $Y(s)$).

$$y'' - 2y' + 2y = \cos(t) \quad y(0) = 1 \quad y'(0) = 0$$