

Practice for Quiz 7

These are sample problems similar to what you might find on the quiz. The quiz itself will be made up of only 2 questions.

Instructions: *Show all of your work. Answers without sufficient justification will receive little or no credit.*

1. Find the Laplace transform for the following functions

(a) $\cos(t) \sin(2t)$

(b) $(t + e^t)^2$

(c) $t^2 \cos(t)^2$

2. Find the inverse Laplace transform of the following functions

(a) $F(s) = \frac{s^2+1}{s^3+4s}$.

(b) $F(s) = \frac{P(s)}{s^4-1}$, where $P(s)$ is a polynomial of degree less than or equal to 3.

(c) $F(s) = \frac{2s+1}{(s^2+2s+1)(s^2+4)}$.

3. Find $Y(s)$, the transform of the solution to the following differential equations

(a)

$$y'' - 6y' + 5y = t \cos(t);$$

$$y(0) = 2 \quad y'(0) = 5.$$

(b)

$$y'' - (t + 1)y' + ty = t \cos(t);$$

$$y(0) = 0 \quad y'(0) = -1.$$