

SEOUL NATIONAL UNIVERSITY
SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING

SYSTEM CONTROL

Fall 2014

Quiz1 Laplace Transformation

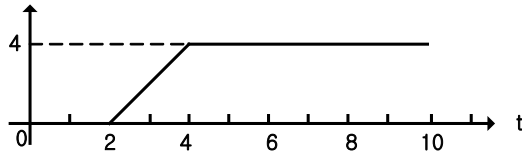
September 18 (Th)

11:00-11:10

Student ID # _____ Name _____

[1] Find the Laplace transforms of a function shown in the figure below:

$f(t)$



Solution

$$\begin{aligned}F(s) &= \int f(t)e^{-st} dt \\&= L[2(t-2) \cdot 1(t-2) - 2(t-4) \cdot 1(t-4)] \\&= L[2(t-2) \cdot 1(t-2)] - L[2(t-4) \cdot 1(t-4)] \\&= \frac{2}{s^2}e^{-2s} - \frac{2}{s^2}e^{-4s} \\&= \frac{2}{s^2}(1 - e^{-2s})e^{-2s}\end{aligned}$$