

MISSOURI

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MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Section 7.5

Solving Initial Value Problems using Laplace Transforms

Goals for Today

We have previously seen how to calculate the Laplace transform of a wide variety of functions and of derivatives of functions and also considered how to find inverse Laplace transforms.

Today, we will put all this together to solve initial value problems.

Example 1

Use Laplace transforms to solve the initial value problem

$$y'' + 4y = e^{-3t}, y(0) = 1, y'(0) = -3$$

Example 2

Use Laplace transforms to solve the initial value problem

$$y'' - 4y' + 4y = 0, y(0) = 1, y'(0) = 1$$

Example 3

Use Laplace transforms to solve the initial value problem

$$y'' + 3y' + 3y = t, y(0) = 0, y'(0) = 0$$
