
MATH 213 - Tutorial 3: Using Laplace to solve linear constant coefficient coefficients - Solutions

1. Use the Laplace transform to solve the initial value problem

$$-2y' + y = 0, \quad y(0) = 1.$$

Verify that your solution works.

2. Use the Laplace transform to solve the initial value problem

$$y'' - 2y' - 3y = 0, \quad y(0) = 2, \quad y'(0) = -1.$$

Verify that your solution works.

3. Use the Laplace transform to solve the initial value problem

$$y'' + 2y' + 2y = 0, \quad y(0) = -1, \quad y'(0) = 2.$$

Verify that your solution works.

4. Use the Laplace transform to solve the initial value problem

$$y'' - y' - 2y = \sin(3t), \quad y(0) = 1, \quad y'(0) = -1.$$

After taking the Laplace transform but before taking the inverse Laplace transform, argue why the solution will be unbounded.

For extra practice for See Paul's notes.