

Espacio t

Problema dado

$$y'' - y = t$$

$$y(0) = 1$$

$$y'(0) = 1$$

Espacio s

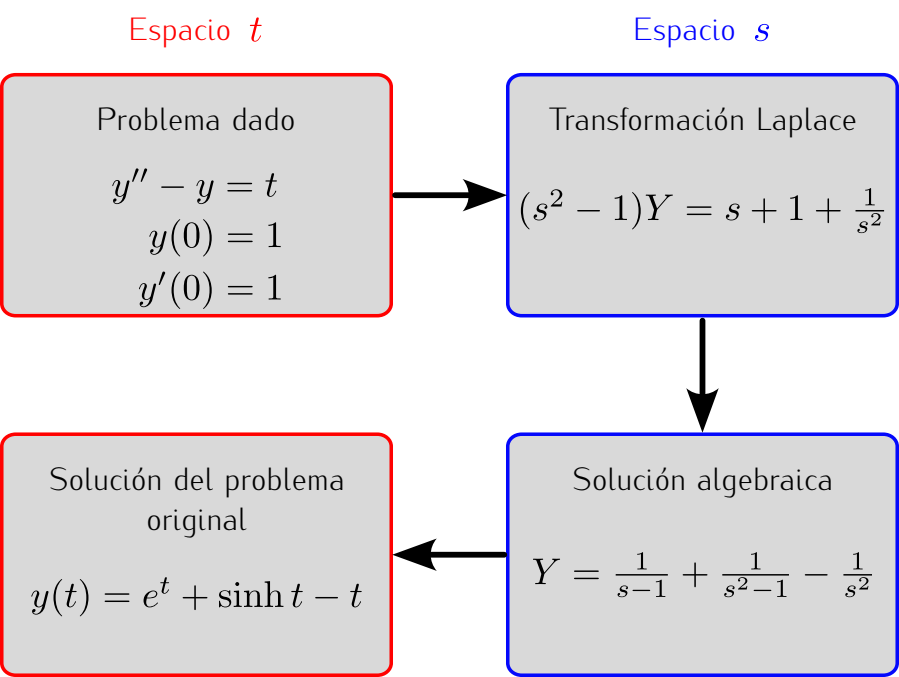
Transformación Laplace

$$(s^2 - 1)Y = s + 1 + \frac{1}{s^2}$$

Solución del problema
original

$$y(t) = e^t + \sinh t - t$$

Solución algebraica

$$Y = \frac{1}{s-1} + \frac{1}{s^2-1} - \frac{1}{s^2}$$
A flowchart illustrating the solution of a differential equation using the Laplace transform. It consists of four rectangular boxes arranged in a square pattern, connected by arrows. The top-left box, labeled 'Espacio t' in red, contains the initial problem: y'' - y = t, y(0) = 1, and y'(0) = 1. An arrow points from this box to the top-right box, labeled 'Espacio s' in blue, which shows the transformed equation: (s^2 - 1)Y = s + 1 + 1/s^2. From the top-right box, an arrow points down to the bottom-right box, also labeled 'Espacio s' in blue, which shows the algebraic solution: Y = 1/(s-1) + 1/(s^2-1) - 1/s^2. Finally, an arrow points from the bottom-right box to the bottom-left box, labeled 'Espacio t' in red, which shows the final solution in the time domain: y(t) = e^t + sinh t - t.