Örnek :
$$\frac{d^2y(t)}{dt^2} + 2\frac{dy(t)}{dt} - 3y(t) = 0$$

$$y(0) = 9 \qquad y'(0) = 1$$

$$y(t) = ?$$

Denklemin Laplace dönüşümü yapılırsa;

$$\left[s^2 Y(s) - Sy(0) - y'(0)\right] + 2\left[sY(s) - y(0)\right] - 3Y(s) = 0$$

$$[s^2 + 2s - 3] Y(s) = 9s + 19$$

$$Y(s) = \frac{9s + 19}{s^2 + 2s - 3}$$

$$\diagup \qquad \diagdown$$
$$(s+3) \qquad (s-1)$$

$$\frac{A}{s+3} \qquad \frac{B}{s-1} \qquad \begin{array}{l} A = 2 \\ B = 7 \end{array}$$

$$Y(s) = \frac{2}{s+3} + \frac{7}{s-1}$$

$$\mathcal{L}^{-1}\{Y(s)\} = y(t) = 2e^{-3t}u(t) + 7e^{t}u(t)$$

Örnek: $y''(t) - 6y'(t) + 13y(t) = 0$

$$y(0) = 3 \qquad y'(0) = 5$$

$$y(t) = ?$$

Laplace dönüşümü alınırsa;

$$s^2 Y(s) - sy(0) - y'(0) - 6\left[sY(s) - y(0)\right] + 13Y(s) = 0$$

$$(s^2 - 6s + 13)\, Y(s) = 3s - 13$$

$$Y(s) = \frac{3s - 13}{s^2 - 6s + 13}$$

$$(s-3)^2 + 2^2 \qquad \text{şeklinde}$$

Tabloya benzetebilme adına; $\longrightarrow$ ifade edilebilir.

$$Y(s) = 3 \cdot \frac{s-3}{(s-3)^2 + 2^2} - 2\, \frac{2}{(s-3)^2 + 2^2}$$

$$\mathcal{L}^{-1}\left\{Y(s)\right\} = y(t) = 3\cos 2t \cdot e^{3t}\, u(t) - 2\sin 2t\, e^{3t}\, u(t)$$