

Dr. Z.'s Calc5 Homework assignment 2

In Problems 1-6, find the inverse Laplace transforms.

1.

$$\mathcal{L}^{-1} \left\{ \frac{1}{s^4} \right\}$$

2.

$$\mathcal{L}^{-1} \left\{ \frac{2}{s^3} - \frac{6}{s^2} \right\}$$

3.

$$\mathcal{L}^{-1} \left\{ \frac{(s+1)^2}{s^3} \right\}$$

4.

$$\mathcal{L}^{-1} \left\{ \frac{1}{s^2 + 2s - 3} \right\}$$

5.

$$\mathcal{L}^{-1} \left\{ \frac{1}{s^3 + 5s} \right\}$$

6.

$$\mathcal{L}^{-1} \left\{ \frac{1}{(s-1)(s+1)(s+2)} \right\}$$

In Problems 7-11, use the Laplace Transform to solve the given initial-value problems.

7.

$$\frac{dy}{dt} - 2y = 1 \quad , \quad y(0) = 0 \quad .$$

8.

$$y' + 2y = 8e^{2t} \quad , \quad y(0) = 3 \quad .$$

9.

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

10.

$$y'' - y = 3e^{2t} \quad , \quad y(0) = 1 \quad , \quad y'(0) = 4 \quad .$$

11.

$$y'' + y = \sin 2t \quad , \quad y(0) = 0 \quad , \quad y'(0) = 0 \quad .$$