

$$23. \mathcal{L}\{t^2 + 6t - 3\} = \frac{2}{s^3} + \frac{6}{s^2} - \frac{3}{s}$$

$$27. \mathcal{L}\{1 + e^{4t}\} = \frac{1}{s} + \frac{1}{s-4}$$

$$31. \mathcal{L}\{4t^2 - 5 \sin 3t\} = 4\frac{2}{s^3} - 5\frac{3}{s^2+9}$$

$$33. \mathcal{L}\{\sinh kt\} = \frac{1}{2} \mathcal{L}\{e^{kt} - e^{-kt}\} = \frac{1}{2} \left[\frac{1}{s-k} - \frac{1}{s+k} \right] = \frac{k}{s^2 - k^2}$$

$$42. \text{(a)} \quad \mathcal{L}\{t^{-1/2}\} = \frac{\Gamma(1/2)}{s^{1/2}} = \sqrt{\frac{\pi}{s}}$$

$$\text{(b)} \quad \mathcal{L}\{t^{1/2}\} = \frac{\Gamma(3/2)}{s^{3/2}} = \frac{\sqrt{\pi}}{2s^{3/2}}$$

$$\text{(c)} \quad \mathcal{L}\{t^{3/2}\} = \frac{\Gamma(5/2)}{s^{5/2}} = \frac{3\sqrt{\pi}}{4s^{5/2}}$$