

37. $\mathcal{L}\{(t-1)\mathcal{U}(t-1)\} = \frac{e^{-s}}{s^2}$

39. $\mathcal{L}\{t\mathcal{U}(t-2)\} = \mathcal{L}\{(t-2)\mathcal{U}(t-2) + 2\mathcal{U}(t-2)\} = \frac{e^{-2s}}{s^2} + \frac{2e^{-2s}}{s}$

Alternatively, (16) of this section in the text could be used:

$$\mathcal{L}\{t\mathcal{U}(t-2)\} = e^{-2s} \mathcal{L}\{t+2\} = e^{-2s} \left(\frac{1}{s^2} + \frac{2}{s} \right).$$

43. $\mathcal{L}^{-1}\left\{\frac{e^{-2s}}{s^3}\right\} = \mathcal{L}^{-1}\left\{\frac{1}{2} \cdot \frac{2}{s^3} e^{-2s}\right\} = \frac{1}{2}(t-2)^2 \mathcal{U}(t-2)$

47. $\mathcal{L}^{-1}\left\{\frac{e^{-s}}{s(s+1)}\right\} = \mathcal{L}^{-1}\left\{\frac{e^{-s}}{s} - \frac{e^{-s}}{s+1}\right\} = \mathcal{U}(t-1) - e^{-(t-1)} \mathcal{U}(t-1)$

49. (c)

50. (e)

51. (f)

52. (b)

53. (a)

54. (d)