

Determine the inverse Laplace transform of the following.

1. 2  $A(s) = \frac{7}{(s+2)^4}$

$$a(t) = \frac{7}{3!} t^3 e^{-2t} \quad \text{or} \quad \frac{7}{6} t^3 e^{-2t}$$

2. 2  $B(s) = \frac{2}{2s+1} - \frac{3}{5-s} = \frac{1}{s+\frac{1}{2}} + \frac{3}{s-5}$

$$b(t) = e^{-t/2} + 3e^{5t}$$

3. 3  $C(s) = \frac{4s}{s^2+4s+13} = \frac{A(s+2) - \frac{8}{3} \cdot 3}{(s+2)^2 + 3^2}$

$$c(t) = 4e^{-2t} \cos 3t - \frac{8}{3} e^{-2t} \sin 3t$$

4. 3  $D(s) = \frac{s+17}{s^2-s-6} = \frac{A}{s-3} + \frac{B}{s+2}$

$$s+17 = A(s+2) + B(s-3)$$

$$s=3 \Rightarrow 20 = 5A \quad \text{so} \quad A=4$$

$$s=-2 \Rightarrow 15 = -5B \quad \text{so} \quad B=-3$$

$$d(t) = 4e^{3t} - 3e^{-2t}$$