(a) $F(s) = \dfrac{s+3}{(s+1)(s+2)} = \dfrac{A}{s+1} + \dfrac{B}{s+2}$

$$A = (s+1)\left.\frac{s+3}{(s+1)(s+2)}\right|_{s=-1} = \frac{2}{1} = 2$$

$$B = (s+2)\left.\frac{s+3}{(s+1)(s+2)}\right|_{s=-2} = \frac{1}{-1} = -1$$

$$F(s) = \frac{2}{s+1} - \frac{1}{s+2}$$

$$f(t) = \left(2e^{-t} - e^{-2t}\right)u(t)$$