1) a) $F(s) = \frac{s+3}{(s+1)(s+2)} = \frac{a_1}{s+1} + \frac{a_2}{s+2}$

$s+3 = a_1(s+2) + a_2(s+1)$

Set $s = -1$

$-1+3 = a_1(-1+2) + a_2(-1+1)$

$\underline{a_1 = 2}$

Set $s = -2$

$-2+3 = a_1(-2+2) + a_2(-2+1)$

$\underline{a_2 = 1}$

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

$= \underline{2 \cdot e^{-t} - e^{2t}}$