1. (25 points)

a. Find \( f(t) \) if
\[
F(s) = \frac{s + 2}{(s + 1)^2 (s + 4)}
\]

b. Plot the poles and zeros of \( G(s) \) in the \( s \) plane
\[
G(s) = \frac{12 + 4s}{(s + 2)(s^2 + 25)(s^2 + 6s + 25)}
\]

c. Find \( \lim_{t \to 0^+} f(t) \) if
\[
F(s) = \frac{3(s^3 + 7s^2 + 14s + 8)}{s^4 + 14s^3 + 98s^2 + 350s + 625}
\]

d. Find \( \lim_{t \to \infty} f(t) \) if
\[
F(s) = \frac{2s^4 + 6s^3 + 30s^2 + 25s + 120}{s^6 + 14s^5 + 112s^4 + 448s^3 + 975s^2 + 625s}
\]
(All poles of \( F(s) \) are in the left-half plane.)

e. Write an expression for \( H(s) \).
2. (45 points)

The current source is a dc current source. After being open for a long time, the switch is closed at \( t = 0 \).

a. Write a numerical time-domain expression for \( v(t) \).

b. From the Laplace transform of \( v(t) \), find the numerical values of \( v(t) \) for \( t = 0^+ \) and \( t \to \infty \).

3. (30 points)

Construct an s-domain Thevenin's equivalent to the circuit at the terminals a-b. There is no initial energy stored in the circuit.