EE 212 HW 2 Soln

PR 8.17 b) $\frac{-8}{2+j3} = \frac{8e^{j180°}}{3.61e^{j56.3°}} = \boxed{2.22e^{j123.7°} = 2.22e^{j2.16}}$

c) $\frac{j3}{-2+j} = \frac{3e^{j90°}}{2.24e^{j153.4°}} = \boxed{1.34e^{-j63.4°} = 1.34e^{-j1.11}}$

f) $\frac{20(1+j)}{4+j3}e^{-j30°} = \frac{20(1.414e^{j45°})}{5e^{j36.9°}}e^{-j30°} = \boxed{5.66e^{-j21.9°} = 5.66e^{j0.382}}$

g) $37.1e^{j14°} + 20.6e^{-j166°} = (36+9j) + (-20-5j)$
$= 16+4j = \boxed{16.5e^{j14°} = 16.5e^{j0.244}}$

PR 8.18 b) $2.22e^{j123.7°} = \boxed{-1.231 + j1.85}$

c) $1.34e^{-j63.4°} = \boxed{0.6 - j1.2}$

f) $5.66e^{-j21.9°} = \boxed{5.25 - j2.11}$

g) $\boxed{16+j4}$

DE 8.5 $f = 60Hz \Rightarrow \omega = 2\pi(60) = 120\pi$ rad/sec

a) $\boxed{Z_R = 100\Omega, \quad Y_R = \frac{1}{100} = 0.01S}$

b) $\boxed{Z_L = j\omega L = j(120\pi)(0.05) = j18.85\Omega}$
$\boxed{Y_L = \frac{1}{Z_L} = -j0.053S}$

c) $\boxed{Z_C = \frac{1}{j\omega C} = \frac{1}{j120\pi(100\times10^{-6})} = -j26.5\Omega}$
$\boxed{Y_C = \frac{1}{Z_C} = j0.038S}$