

Elementary Engineering Mathematics

Exercises #5 Answers

1. a) $Z \approx 80 - j53 \approx 96 \angle (-33.5^\circ)$ (Ω)
b) $I \approx 1.15 \angle (93.5^\circ) \approx -0.0704 + j1.14$ (amps)
c) $i(t) \approx 1.15 \cos(120\pi t + 1.632)$ (amps)
2. a) $Z \approx 75 + j46.8 \approx 88.4 \angle (32^\circ)$ (Ω)
b) $I \approx 1.24 \angle (-31.95^\circ) \approx 1.06 - j0.659$ (amps)
c) $i(t) \approx 1.24 \cos(120\pi t - 0.5577)$ (amps)
3. a) $Z_R + Z_C \approx 100 - j75.8 \approx 125 \angle (-37.2^\circ)$ (Ω) and $Z_L \approx 189 \angle (90^\circ) \approx j189$ (Ω)
b) $Z_{eq} \approx 157 \angle (4.42^\circ)$ (Ω)
4. a) $Z_{eq} \approx 244 \angle (17.7^\circ)$ (Ω)
b) $I \approx 0.451 \angle (42.3^\circ)$ (amps)
b) $i(t) \approx 0.451 \cos(120\pi t + 0.738)$ (amps)