Chapter 9, Solution 10.

Design a problem to help other students to better understand phasors.

Although there are many ways to work this problem, this is an example based on the same kind of problem asked in the third edition.

Problem

Given that $z_1 = 6 - j8$, $z_2 = 10\angle -30^\circ$, and $z_3 = 8e^{-j120^\circ}$, find:

(a) $z_1 + z_2 + z_3$

(b) $z_1 z_2 / z_3$

Solution

(a) $z_1 = 6 - j8, \quad z_2 = 8.66 - j5, \text{ and } \quad z_3 = -4 - j6.9282$

$z_1 + z_2 + z_3 =$ **(10.66 – j19.928)Ω**

(b) $\frac{z_1 z_2}{z_3} = [(10\angle -53.13^\circ)(10\angle -30^\circ)/(8\angle -120^\circ)] = 12.5\angle 36.87^\circ \Omega =$ **(10 + j7.5) Ω**