HW 24 #1

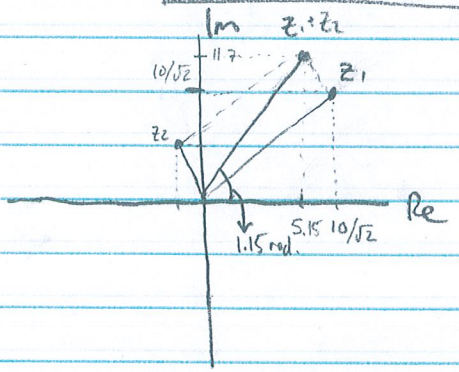
$z_1 = 10e^{j\pi/4} = 10\cos\pi/4 + j10\sin\pi/4 = 10/\sqrt{2} + j10/\sqrt{2}$

$z_2 = 5e^{j\pi 5/8} = 5\cos\pi 5/8 + j5\sin\pi 5/8$

$= -1.913 + j4.62$

$z_1 + z_2 = (10/\sqrt{2} - 1.913) + j(10/\sqrt{2} + 4.62)$

$= 5.15 + j11.7 \quad = 12.78e^{j1.15}$



#2 $z_1 = 2 + j = \sqrt{5}e^{j0.463}$

$z_2 = -3/5 + j4/5 = 1e^{2.214}$

a, b) $z_1 z_2 = \sqrt{5}e^{j(.463 + 2.214)} = \sqrt{5}e^{j2.677} = -2 + j$

c) $|z_1| = \sqrt{5}$

$|z_2| = 1$

$|z_1 z_2| = \sqrt{5} = |z_1||z_2|$.

d) $\theta_{z_1} = .463$

$\theta_{z_2} = 2.214$

$\theta_{z_1 z_2} = 2.677 = \theta_{z_1} + \theta_{z_2}$.

#3 $z_1/z_2 = \sqrt{5}e^{j.463} / 1e^{j2.214} = \frac{\sqrt{5}}{1} e^{j(.463-2.214)}$

a, b) $= \sqrt{5}e^{-j1.751} = -.4 - j2.2$

c) $|z_1| = \sqrt{5}$

$|z_2| = 1$

$|z_1/z_2| = \sqrt{5} = |z_1|/|z_2|$

d) $\theta_{z_1} = .463$

$\theta_{z_2} = 2.214$

$\theta_{z_1/z_2} = -1.751 = \theta_{z_1} - \theta_{z_2}$.