

9.38 Evaluate the following complex numbers and express your answers in polar form:

$$(a) (4 \angle 30^\circ - 10 \angle 50^\circ)^{1/2}$$

$$(b) \frac{1 + j2}{6 + j8 - 7 \angle 15^\circ}$$

$$(c) \frac{(3 + j4)^2}{12 - j7 + (-6 + j10)^*}$$

$$(d) \frac{(3.6 \angle -200^\circ)^{1/2}}{(2.4 \angle 45^\circ)^2 (-5 + j8)^*}$$

$$a) (4 \angle 30^\circ - 10 \angle 50^\circ)^{1/2} = (6.3894 \angle -117.636^\circ)^{1/2} = \underline{\underline{2.5277 \angle -58.818^\circ}}$$

$$b) \frac{1 + j2}{6 + j8 - 7 \angle 15^\circ} = \frac{2.236 \angle 63.43^\circ}{6.235 \angle 97.015^\circ} = \underline{\underline{0.3586 \angle -33.58^\circ}}$$

$$c) \frac{(3 + j4)^2}{12 - j7 + (-6 + j10)^*} = \frac{-7 + j24}{12 - j7 - 6 - j10} = \underline{\underline{1.38675 \angle 176.82^\circ}}$$

$$d) \frac{(3.6 \angle -200^\circ)^{1/2}}{(2.4 \angle 45^\circ)^2 (-5 + j8)^*} = \frac{(3.6 \angle -200^\circ)^{1/2}}{(5.76 \angle 90^\circ)(-5 - j8)} = \underline{\underline{0.034917 \angle 112.005^\circ}}$$