1) $z_1 = 5 + 2i$

$z_1 = \sqrt{29}\left(\cos(\tan^{-1}(\frac{2}{5})) + i\sin(\tan^{-1}(\frac{2}{5}))\right)$

$z_1 = \sqrt{29}\, e^{i\tan^{-1}(\frac{2}{5})}$

$z_2 = -3 + i$

$z_2 = \sqrt{10}\left(\cos(\tan^{-1}(\frac{1}{3}) + \pi) + i\sin(\tan^{-1}(-\frac{1}{3}) + \pi)\right)$

$z_2 = \sqrt{10}\, e^{i(\tan^{-1}(-\frac{1}{3}) + \pi)}$

$z_3 = -6 - 3i$

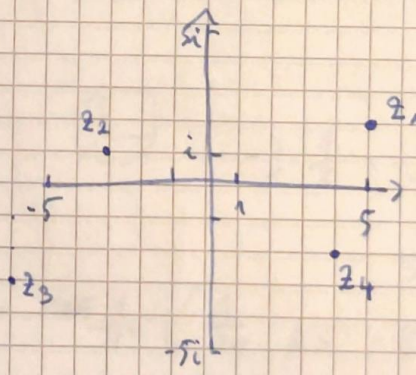
$z_3 = \sqrt{45}\left(\cos(\tan^{-1}(\frac{1}{2}) + \pi) + i\sin(\tan^{-1}(\frac{1}{2}) + \pi)\right)$

$z_3 = \sqrt{45}\, e^{i(\tan^{-1}(\frac{1}{2}) + \pi)}$

$z_4 = 4 - 2i$

$z_4 = \sqrt{20}\left(\cos(\tan^{-1}(\frac{1}{2}) + 2\pi) + i\sin(\tan^{-1}(\frac{1}{2}) + 2\pi)\right)$

$z_4 = \sqrt{20}\, e^{i(\tan^{-1}(-\frac{1}{2}) + 2\pi)}$



2) a) $z_1 = 2{,}5 - 1{,}5i$

$|z_1| = \sqrt{2{,}5^2 + 1{,}5^2} \approx 2{,}92$

$z_2 = i z_1 = 1{,}5 + 2{,}5i$

$|z_2| = |z_1| \approx 2{,}92$

$z_3 = z_1^2 = 2{,}5^2 + 1{,}5^2$

$|z_3| = |z_1|^2 = 8{,}5$

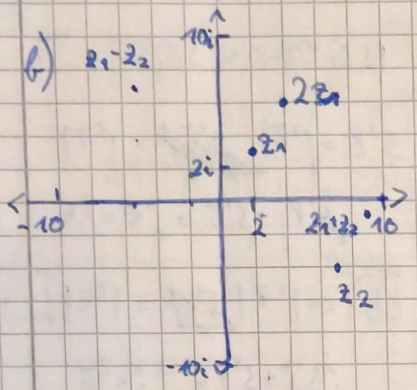
$z_4 = \cos(25) + i\sin(25)$

$|z_4| = 1$

3) $z_1 = 2+3i$, $z_2 = 7-4i$

a) $z_1 + z_2 = \underline{9 - i}$ $\quad z_1 - z_2 = \underline{-5 + 7i}$ $\quad 2z_1 = \underline{4 + 6i}$

b)



c) $z_1 z_2 = 14 + 21i - 8i \cancel{+12} = \underline{26 + 13i}$

$z_1 \bar{z}_2 = 14 + 21i + 8i \cancel{+12} = \underline{2 + 29i}$

$z_2 \bar{z}_2 = 49 + 16 = \underline{65}$

$z_1 / z_2 = \frac{z_1 \bar{z}_2}{z_2 \bar{z}_2} = \underline{\frac{2}{65} + \frac{29}{65} i}$

$|z_2| = \underline{\sqrt{65} \approx 8{,}06}$

4) $\underline{\frac{(4-5i)z - 12 + 3i}{i} = 1 - 6i} \quad | \cdot i - 3i + 12$

$\underline{(4-5i)z = 18 - 2i} \quad \frac{18-2i}{4-5i} \cdot \frac{4+5i}{4+5i}$

$z = \frac{82}{41} \underline{2 + 2i}$

5) $R_\Omega = 60\,\Omega \quad R_C = -50i\,\Omega \quad R_L = 70i\,\Omega$

Serie: $R = 60 + 20i\ \Omega \quad |R| = \sqrt{4000} = \underline{20\sqrt{10} \approx 63{,}24\ \Omega}$

Parallel: $\frac{1}{R} = \frac{1}{60} + \frac{1}{20i} - \frac{1}{50i} \quad \frac{1}{R} = \frac{3500i - 3000i + 4200i}{60 \cdot 70i \cdot 50i} = \cancel{\frac{1}{175}i}$

$\frac{1}{R} = \cancel{\frac{1}{60} + \frac{1}{175}i} \quad \frac{35 + 12i}{2100} \Rightarrow R = \frac{2100}{35 + 12i} \approx 53{,}68 - 18{,}41i$

$|R| = \cancel{\quad} \approx 56{,}74\ \Omega$

~~Serie~~ Serie: $I = \frac{220}{63{,}24} = 3{,}47\,A$

Parallel: $I = \frac{220}{56{,}74} = 3{,}87\,A$