$\boxed{\begin{matrix} 3.52 \\ 8 \end{matrix}}$

(א) $z_1 = r_1 \operatorname{cis}\alpha \qquad z_2 = r_2 \operatorname{cis}\beta$

$\arg z_1 - \arg z_2 = \alpha - \beta$

$\arg\left(\frac{z_1}{z_2}\right) = \arg\left(\frac{r_1 \operatorname{cis}\alpha}{r_2 \operatorname{cis}\beta}\right) = \alpha - \beta$

(ב) $\left|\frac{x^2-y^2+2xyi}{\sqrt{2}xy + i\sqrt{x^4+y^4}}\right| = \frac{|x^2-y^2+2xyi|}{|\sqrt{2}xy + i\sqrt{x^4+y^4}|} = \frac{\sqrt{(x^2-y^2)^2+(2xy)^2}}{((\sqrt{2}xy)^2+(\sqrt{x^4+y^4})^2)^2} =$

$= \sqrt{\frac{x^4-2x^2y^2+y^4+4x^2y^2}{2x^2y^2+x^4+y^4}} = \sqrt{\frac{x^4+2x^2y^2+y^4}{x^4+2x^2y^2+y^4}} = 1$

(ג) $4 \geq |z-i| = |x+iy-i| = \sqrt{x^2+(y-1)^2} \to 16 \geq x^2+(y-1)^2$

$1 \geq \operatorname{Re} z^2 = \operatorname{Re}(x^2+2xyi-y^2) \to \quad 1 \geq x^2-y^2$ (היפרבולה)