$\rho_B(I)\gamma_B = \rho_B\gamma_B\rho_B\gamma_B(I)$, For all images

Prof that

1) $\rho_B\gamma_B \geq \rho_B\gamma_B\rho_B\gamma_B$
2) $\rho_B\gamma_B \leq \rho_B\gamma_B\rho_B\gamma_B$

1) $\rho_B\gamma_B = \rho_B\gamma_B$
$\rho_B\gamma_B\rho_B\rho_B = \rho_B\gamma_B$
$\rho_B\gamma_B\rho_B\gamma_B \geq \rho_B\gamma_B$

2) $\rho_B\gamma_B = \rho_B\gamma_B$
$\rho_B\gamma_B = \rho_B\gamma_B\rho_B\rho_B$
$\rho_B\gamma_B \geq \rho_B\gamma_B\rho_B\gamma_B$