

$$\frac{\sin\left(\sqrt{\rho-1-2\lambda_1^{L+y}}x\right)}{\sin\left(\sqrt{\rho-1-2\lambda_1^{L+y}}\right)}\frac{\sin\left(\sqrt{\rho-1-2\lambda_1^L}\right)}{\sin\left(\sqrt{\rho-1-2\lambda_1^L}x\right)}\rightarrow 1$$