The **real part** gives

$$r = \frac{1 - \mathrm{Re}^2(\Gamma) - \mathrm{Im}^2(\Gamma)}{\left(1 - \mathrm{Re}(\Gamma)\right)^2 + \mathrm{Im}^2(\Gamma)}$$

Add a quantity equal to zero

$$r\left(\mathrm{Re}(\Gamma) - 1\right)^2 + \left(\mathrm{Re}^2(\Gamma) - 1\right) + r\,\mathrm{Im}^2(\Gamma) + \mathrm{Im}^2(\Gamma) + \underbrace{\frac{1}{1+r} - \frac{1}{1+r}}_{=0} = 0$$

$$\left[r\left(\mathrm{Re}(\Gamma) - 1\right)^2 + \left(\mathrm{Re}^2(\Gamma) - 1\right) + \frac{1}{1+r}\right] + (1+r)\,\mathrm{Im}^2(\Gamma) = \frac{1}{1+r}$$

$$(1+r)\left[\mathrm{Re}^2(\Gamma) - 2\,\mathrm{Re}(\Gamma)\frac{r}{1+r} + \frac{r^2}{(1+r)^2}\right] + (1+r)\,\mathrm{Im}^2(\Gamma) = \frac{1}{1+r}$$

$$\Rightarrow \quad \left[\mathrm{Re}(\Gamma) - \frac{r}{1+r}\right]^2 + \mathrm{Im}^2(\Gamma) = \left(\frac{1}{1+r}\right)^2$$

Equation of a circle