$$|H(jw)| = \frac{w^2}{\sqrt{(w_0{}^2 - w^2)^2 + (w\frac{w_0}{Q})^2}}$$

$$\frac{w^2}{\sqrt{(w_0{}^2 - w^2)^2 + (w\frac{w_0}{Q})^2}} = \frac{\sqrt{2}}{2}$$

$$\left(\frac{w^2}{\sqrt{(w_0{}^2 - w^2)^2 + (w\frac{w_0}{Q})^2}}\right)^2 = \frac{1}{2}$$

$$\frac{(w^2)^2}{(w_0{}^2 - w^2)^2 + (w\frac{w_0}{Q})^2} = \frac{1}{2}$$

$$w_0{}^4 - (2w_0{}^2 + (\frac{w_0}{Q})^2)w^2 + w^4 = 0$$

Hago un cambio de variable $x = w^2$

$$w_{1,2} = \frac{w_0(\sqrt{1+Q^2} \pm 1)}{2Q} \text{Y con } w_0 = 2\pi*1\text{Hz y } \frac{w_0}{Q} = \frac{1}{RC} \rightarrow Q = RC$$

$$\textbf{\textit{Ancho de banda}} = \textbf{\textit{w}}_2 - \textbf{\textit{w}}_1 = (\frac{(\sqrt{1+(RC)^2} -1)}{2(RC)}) - (-\frac{(\sqrt{1+(RC)^2} +1)}{2(RC)})$$