

$$Q = \frac{1}{1.414} = 0.707$$

$$\alpha_0 = 1$$

$$FSF = 1$$

$$\alpha_1 = 1.414$$

$$R_1 = mR \quad C_1 = C$$

$$Q = \frac{1}{\alpha_1}$$

$$R_2 = R \quad C_2 = nC$$

$$FSF = \alpha_0$$

$$Q = \frac{\sqrt{mn}}{m+1}$$

$$0.707(m+1) = \sqrt{mn}$$

$$0.707m + 0.707 = \sqrt{mn}$$

$$0.707^2 m^2 + 0.707 \times 2mn + 0.707^2 = mn$$

$$0.707^2 m^2 + 1.414 mn + 0.707^2 = mn$$

$$0.707^2 m^2 + 0.414 mn + 0.707^2 = 0$$

$$0.707^2 m^2 + 0.414 m n + 0.707^2 = 0$$

$$D = (0.414n)^2 - 4 \times 0.707^2 \times 0.707^2$$

$$m_{1,2} = \frac{-0.414n \pm \sqrt{0.414^2 n^2 - 4 \times 0.707^4}}{2}$$

negative

$$m = \frac{-0.414n + \sqrt{0.414^2 n^2 - 4 \times 0.707^4}}{2}$$

$$0.707$$

$$1 \times 20 = \frac{1}{2\pi \sqrt{m n}}$$

$$m = \frac{1}{1600 \pi^2 n}$$

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$$n = \frac{1}{1600\pi^2 m}$$

$$Q = \frac{\sqrt{mh}}{m+1}$$

$$0.707 = \sqrt{\frac{m}{1600\pi^2 m}} \times \frac{1}{m+1}$$

$$0.707 = \frac{1}{40\pi} \times \frac{1}{m+1}$$

$$0.707 = \frac{1}{40\pi(m+1)}$$

$$40\pi(m+1) = 1.414$$

$$m+1 = \frac{1.414}{40\pi}$$

$$Q. 707^2 = \frac{mh}{m^2 + 2m + 1}$$

$$Q. 707^2 m^2 + 2 \times 0.707^2 m + 0.707^2 = mh$$

$$0.707^2 m^2 + (2 \times 0.707^2 - h) m + 0.707^2 = 0$$

$$D = (2 \times 0.707^2 - h)^2 - 4 \times 0.707^2 \times 0.707^2$$

$$D = (2 \times 0.707^2 - h)^2 - 4 \times 0.707^4$$

$$m = \frac{h - 2 \times 0.707^2 \pm \sqrt{(2 \times 0.707^2 - h)^2 - 4 \times 0.707^4}}{2 \times 0.707^2}$$

↑  
Gives a graph

try

$$\text{ex: } m = 5$$

$$n = 3.6$$

$$m = 8$$

$$h = 5$$

$$20 = \frac{1}{2\pi RC \sqrt{40}}$$

$$R = \frac{1}{40\pi C \sqrt{40}}$$

$$\text{ex: } f_c = 25 \text{ Hz}$$

$$m = 1$$

$$h = 2$$

$$25 = \frac{1}{\sqrt{2} \times 2\pi RC}$$

$$R = \frac{1}{\sqrt{2} \times 50\pi C}$$

$$FSF \cdot f_c = \frac{1}{2\pi RC \sqrt{m h}}$$

$$C = 0.01 \mu\text{F}$$

$$C = 0.015 \mu\text{F} \Rightarrow$$

$$R = 300 \text{ k}$$