#4) attenuate frequency > $\omega = 100$

dB < 0 for $\omega > 100$

this means adding a pole @ $\omega = 100$

$$\frac{K}{\left(\frac{s}{100}+1\right)}$$

this is to force the value down @ 100 since originally it was above by a little.

Then, to make DC gain = 1, we push it back up with a zero.

@ $100\sqrt{2}\cdot\sqrt{2}$ to keep the ~~ratio~~ that 100√2 bought it down with.
ratio

$$\frac{1\,K}{\left(\frac{s}{100}+1\right)}\left(\frac{s}{100\sqrt{2}}+1\right) \Rightarrow \frac{1\,K}{\left(\frac{s}{100}+1\right)}\left(\frac{s}{200}+1\right)$$

$$\frac{K(s+200)}{(2s+1)} \quad K=1 \quad = \quad \frac{0.5(s+200)}{(s+1)}$$

$$= \frac{s+200}{2s+200} = \boxed{\frac{0.5(s+200)}{(s+100)}}$$

YAY

on second thought, the $s+200$ will raise the value @ 100 by a little bit, cancelling out the attenuation, so not quite sure if that's fixable

Just move back 1 dec: $\boxed{\frac{0.5(s+20)}{s+10}}$