

$$\xi := 0.32 \quad \omega_n := 8.46 \cdot 2 \cdot \pi \quad p_1 := 45.8 \cdot 2 \cdot \pi \quad p_2 := 1.63 \cdot 2 \cdot \pi$$

$$H(s) := \frac{s^2 + 2\xi \cdot \omega_n \cdot s + \omega_n^2}{(s + p_1) \cdot (s + p_2)}$$

$$H(s) \text{ collect} \rightarrow \frac{6.25e33 \cdot s^2 + 2.1262299079495720638e35 \cdot s + 1.7659584458825178483e37}{6.25e33 \cdot s^2 + 1.8625717444970486662e36 \cdot s + 1.8420136173973124457e37}$$

$$H(s) \text{ factor} \rightarrow \frac{6250000000000000 \cdot (1.0e18 \cdot s^2 + 3.4019678527193153021e19 \cdot s + 2.8255335134120285573e21)}{(6.25e15 \cdot s + 1.798561794180156629e18) \cdot (1.0e18 \cdot s + 1.0241592050702725957e19)}$$

$$H(s) \left\{ \begin{array}{l} \text{simplify} \\ \text{factor} \end{array} \right. \rightarrow \frac{1.0e18 \cdot s^2 + 3.4019678527193153021e19 \cdot s + 2.8255335134120285573e21}{1.0e18 \cdot s^2 + 2.980114791195277866e20 \cdot s + 2.9472217878356999132e21}$$

$$H(s) \text{ expand} \rightarrow \frac{34.019678527193153021 \cdot s + s^2 + 2825.5335134120285573}{298.0114791195277866 \cdot s + s^2 + 2947.2217878356999132}$$

Next can only be done in Mathcad15- (Menu: Format Result, no loss of precision)

$$H(s) \text{ expand} \rightarrow \frac{34.02 \cdot s + s^2 + 2825.53}{298.01 \cdot s + s^2 + 2947.22}$$

You can do similar via float but you should not use it when you assign the output to a function because you loose precision

$$H(s) \left\{ \begin{array}{l} \text{expand} \\ \text{float, 4} \end{array} \right. \rightarrow \frac{34.02 \cdot s + s^2 + 2826.0}{298.0 \cdot s + s^2 + 2947.0}$$

$$H(s) \left\{ \begin{array}{l} \text{expand} \\ \text{expand} \end{array} \right. \rightarrow \frac{2825.5335134120285573}{298.0114791195277866 \cdot s + s^2 + 2947.2217878356999132} + \frac{s^2}{298.0114791195277866 \cdot s + s^2 + 2947.2}$$

$$H(s) \left\{ \begin{array}{l} \text{simplify} \\ \text{expand} \end{array} \right. \rightarrow \frac{3.4019678527193153021e19 \cdot s}{1.0e18 \cdot s^2 + 2.980114791195277866e20 \cdot s + 2.9472217878356999132e21} + \frac{2.8}{1.0e18 \cdot s^2 + 2.980114791}$$

$$H(s) \text{ simplify} \rightarrow \frac{1.0e18 \cdot s^2 + 3.4019678527193153021e19 \cdot s + 2.8255335134120285573e21}{1.0e18 \cdot s^2 + 2.980114791195277866e20 \cdot s + 2.9472217878356999132e21}$$

$$H(s) \text{ simplify, max} \rightarrow \frac{9.3035848896231626756}{s + 10.241592050702725957} - \frac{273.29538548195779625}{s + 287.76988706882506064} + 1.0$$

Lets try to split in nominator and denominator and put together later again

$$N(s) := \text{denom}(H(s)) \rightarrow 1.0e18 \cdot (1.0e18 \cdot s + 1.0241592050702725957e19) \cdot (6.25e15 \cdot s + 1.798561794180156629e18)$$

$$Z(s) := \text{numer}(H(s)) \rightarrow 6.25e51 \cdot s^2 + 2.1262299079495720638e53 \cdot s + 1.7659584458825178483e55$$

$$\frac{Z(s)}{N(s)} \text{ expand} \rightarrow \frac{2.1262299079495720638e53 \cdot s + 6.25e51 \cdot s^2 + 1.7659584458825178483e55}{1.8625717444970486662e54 \cdot s + 6.25e51 \cdot s^2 + 1.8420136173973124457e55}$$

$$N(s) := N(s) \text{ simplify} \rightarrow 6.25e51 \cdot s^2 + 1.8625717444970486662e54 \cdot s + 1.8420136173973124457e55$$

$$Z(s) := Z(s) \text{ simplify} \rightarrow 2.1262299079495720638e53 \cdot s + 6.25e51 \cdot s^2 + 1.7659584458825178483e55$$

$$\frac{Z(s)}{N(s)} \text{ expand} \rightarrow \frac{1.7659584458825178483e55}{1.8625717444970486662e54 \cdot s + 6.25e51 \cdot s^2 + 1.8420136173973124457e55} + \frac{2.1262299079495720638e53 \cdot s}{1.8625717444970486662e54 \cdot s + 6.25e51 \cdot s^2 + 1.8420136173973124457e55}$$

even worse!!