$$H(z) = \frac{1}{z^{-1} - \frac{5}{2} + z} = \sqrt{\frac{z}{z^2 - \frac{5}{2}z + 1}}$$

We have that:

$$\frac{z}{z^2 - \frac{5}{2} + 1} = \frac{z}{\left(z - \frac{1}{2}\right)(z-2)} = \frac{A}{z - \frac{1}{2}} + \frac{B}{z-2}$$

$$\left\{ \begin{array}{rl} A + B & = 1 \\ -2A - \frac{1}{2}B & = 0 \end{array} \right\} \rightarrow A = -\frac{1}{3},\, B = \frac{4}{3}$$

So:

$$H(z) = \frac{1}{3}\left(-\frac{1}{z - \frac{1}{2}} + 4\frac{1}{z-2}\right) = \frac{1}{3}\left(-\frac{z^{-1}}{1 - \frac{1}{2}z^{-1}} + 4\frac{z^{-1}}{1 - 2z^{-1}}\right)$$

- $\begin{cases} A+ & B = 2 \\ 2A+ & 3B = 1 \end{cases}$
- Hello world $e^{jw} = \cos w + j \sin w$