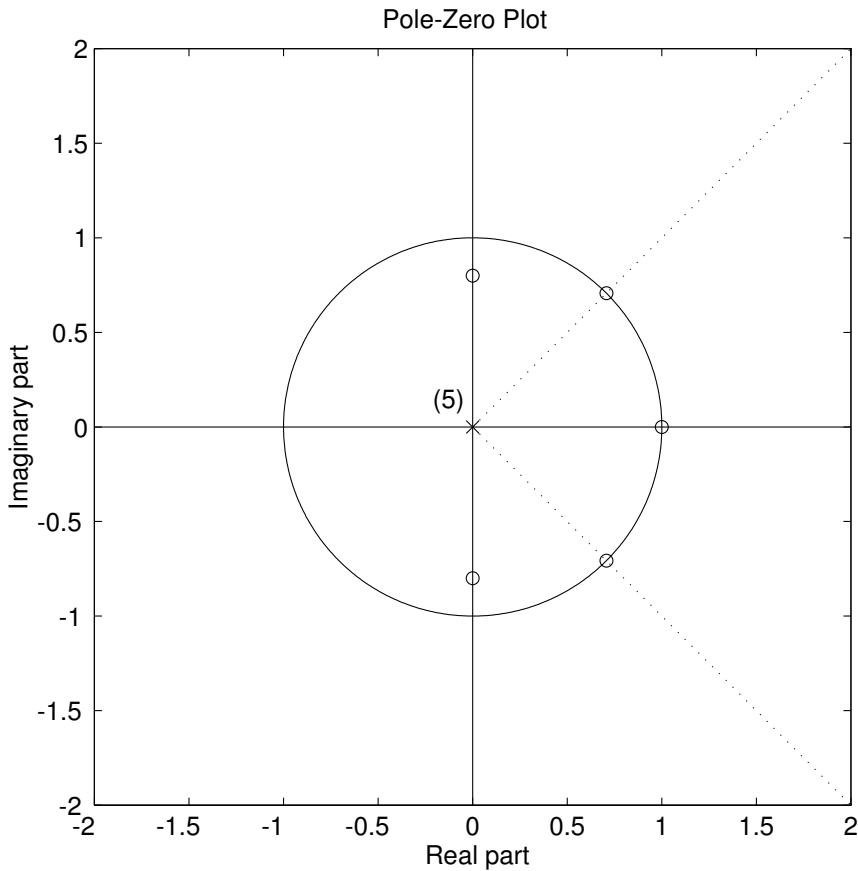


**PROBLEM:**

The above figure gives the pole-zero plot of a LTI discrete-time system with system function  $H(z)$  whose input is  $x[n]$  and whose output is  $y[n]$ .

(a) If the input is of the form

$$x[n] = 10e^{j\pi/3} e^{j\hat{\omega}n}$$

for what values of  $\hat{\omega}$  will the output be zero for all  $n$ ?

(b) The input  $x[n]$  and output  $y[n]$  are related by a difference equation of the form

$$y[n] = \sum_{k=0}^M b_k x[n - k]$$

What is the value of  $M$ ?