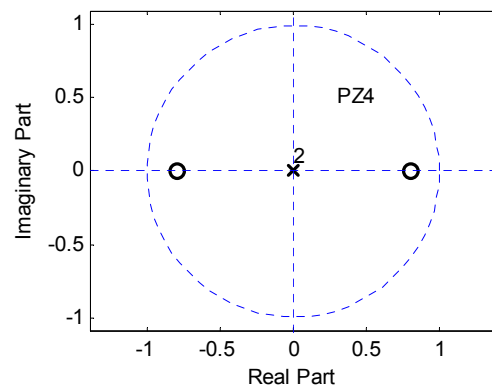
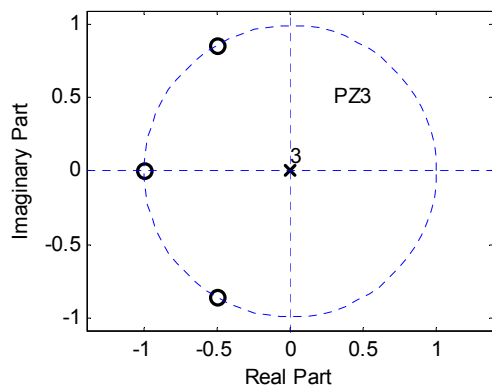
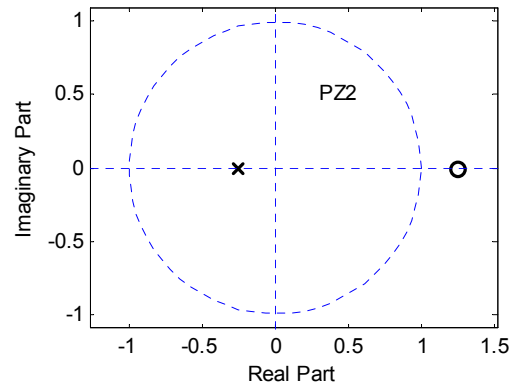
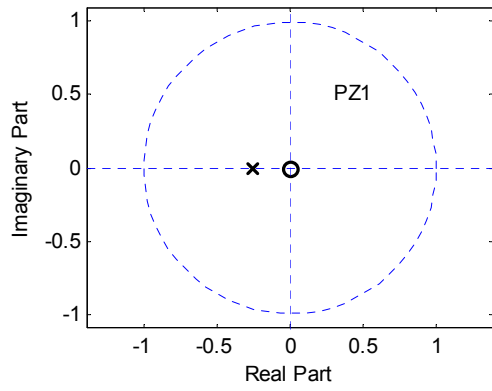


Draw the magnitude frequency responses from the pole-zero plots for the following discrete-time systems. Determine which filters are finite impulse response filter (FIR filters) and which are infinite impulse response filters (IIR Filters).



Each of these discrete-time filters is stable since the poles lie inside the unit circle. Even in PZ2, in which the zero lies outside the unit circle, the pole remains inside the unit circle, and the system is, thus, stable.

Both PZ1 and PZ2 have poles that are located in a position other than the origin. Therefore, these two filters are IIR filters.

All the poles in PZ3 and PZ4 are located at the origin. Therefore, both these filters are FIR filters.

Since the systems are all stable, the magnitude frequency response of each of these filters can be drawn by following the contour around the unit circle from $-\pi$ to π . The resulting magnitude frequency responses are shown below.

