

1. Let  $x[n]$  be a finite length signal,  $N = 7$

(i.e.  $x[n] = 0$  for  $n < 0$  and  $n \geq 7$ )

Given the first 4 samples of DFT  $X[k] = 12, 0, 1, 4$  for  $k = 0, 1, 2$ , and  $3$  respectively

a) Find  $X[k]$  for  $k = 4, 5, 6$

b) What kind of symmetry does  $x[n]$  have?

2. Given signal  $x[n]$  sampled at 5 Hz, you take 5 consecutive readings and call that data  $x_1[n]$

(i.e.,  $x_1[n]$  is zero outside the interval  $0 \leq n < 5$ )

You take its DFT and call it  $X_1[k]$ , What index  $k$  corresponds to signal energy at:

a) 0 Hz?

b) 1 Hz?

c) 2 Hz?

d) 3 Hz?