

EE 451

Homework #5

Due September 24, 2001

1. Determine the z -transforms and sketch the ROC for the following signals:

(a)

$$x_1[n] = \begin{cases} \left(\frac{1}{2}\right)^n, & n \geq 0 \\ \left(\frac{1}{2}\right)^{-n}, & n < 0 \end{cases}$$

(b)

$$x_2[n] = \begin{cases} \left(\frac{1}{3}\right)^n - 2^n, & n \geq 0 \\ 0, & n < 0 \end{cases}$$

(c) $x_3[n] = x_1[n + 4]$

2. Problem 3.96.

3. Problem 3.98.

4. Problem 3.102.

5. Problem 3.108.

6. Determine all possible signals having the following z -transforms:

(a)

$$X(z) = \frac{1}{1 - 1.5z^{-1} + 0.5z^{-2}}$$

(b)

$$X(z) = \frac{1}{1 - 0.5z^{-1} + 0.25z^{-2}}$$

7. Problem M3.16 (page 200).