MthT 430 Projects Chapter 4b Binary Expansions and Examples of Functions

Examples of Functions

For $0 \le x < 1$, let

$$\begin{cases} x = 0._{\text{bin}} b_1 b_2 \ldots, \\ b_k \in \{0, 1\}, \end{cases}$$

with the binary expansion constructed above (in chap4b.tex).

Define the function

$$F_1(x) = b_1.$$

1. Explain why F_1 is a function and describe domain(F_1).

2. Graph F_1.

Define the function

$$F_2(x) = b_2.$$

1. What is domain(F_2)?

2. Graph F_2.

Define the function

$$F_N(x) = b_N.$$

1. What is domain(F_N)?

2. Graph F_N.

3. Discuss

$$\lim_{N \to \infty} F_N(x).$$