

Classroom Chaos 3 Dr. Richard A. DiDio La Salle University

1. Base 3 and Beyond

Create a spreadsheet that calculates the base-3 representation of an integer using the following set-up. Enter values in the input cell (C9) to test.

Cell C7

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	4	3	2	1	0
	=3^D7	=3^E7	=3^F7	=3^G7	=3^H7
<input #=""/>	=INT(C10/D8)	=INT(D10/E8)	=INT(E10/F8)	=INT(F10/G8)	=INT(G10/H8)
=C9	=C10-D9*D8	=D10-E9*E8	=E10-F9*F8	=F10-G9*G8	=G10-H9*H8

Using the above as a model, add a section to your spreadsheet that calculates the base-3 representation of a positive decimal number in [0,1). Enter values in the input cell (C9) to test

2. The Middle-Thirds Cantor Set

For the following first few sets used in the construction of the Middle-Thirds Cantor Set, describe the base three decimal representation of those points in [0,1] not in that particular set.

C₀ = [0,1]

C₁ = $[0, 1/3] \cup [2/3, 1]$

 $\textbf{C_2} \quad = [0, 1/9] \cup [2/9, 3/9] \cup [6/9, 7/9] \cup [8/9, 1]$



3. In Your Own Words

Describe the Middle Thirds Cantor Set in terms of base-three decimals.

4. Is ¹/₄ in the Middle-Thirds Cantor Set?