A First Look At Limits – Doses of Medicine

Investigation
Our kidneys continuously filter our blood, removing impurities.
You will simulate what happens in the body when a patient takes medicine.

Step 1: Suppose a patient takes 16 mL of medicine one time and that the kidneys filter out 25% of the medicine in the blood each day.

A. Make a table like the one below (yours should have more days) recording the amount of medicine in the blood over several days.

Day	Amount of Medicne (mL)
0	16
1	
2	
3	

B. Write a recursive formula that generates the sequence in your table.
C. How many days will pass before there is less than 1 mL of medicine in the blood?
D. Is the medicine ever completely removed from the blood? Why or why not?
E. Sketch a graph and describe what happens in the long run.

Step 2: Now suppose a patient takes 16 mL of medicine and the kidneys filter out 25% of the present medicine in the blood over the day. Then the patient takes another 16 mL of medicine the next day. The patent takes medicine every day after the kidneys have removed 25% of the previous amount present in the blood.

A. Make another table recording the amount of medicine in the blood over several days.
B. Write a recursive formula that generates the sequence in your table.
C.   Does the blood eventually become pure medicine, say 1 Liter? Why or why not?
D. Sketch a graph and explain what happens to the level of medicine in the blood after many days.