

1. Each day, 40 gallons of an additive is added to a chemical that is being stored in a storage tank. Roughly 24 hours after the additive is mixed with the chemical, 25% of the additive breaks down and is “inactive”. 40 gallons of the additive is added every 24 hours.

a. Make a table to show the maximum amount of the additive in the storage tank each day for five days.

b. Sketch a graph of the maximum amounts of the additive and the day number for at least 10 days.

2. Find the partial sum of the first seven terms in the series described in problem 1. Show your methods.

3. What do you notice about the graph of the amount of additive in the storage tank over ten days? What does this mean in the context of the problem? Confirm your claim analytically.

4. Identify if the sequence will converge or diverge. Justify your answer.

Sequence	Diverge or converge	Justification
$14 + 18 + 22 + 26 + 30 + \dots$		
$10000 + 1000 + 100 + 10 + 1 + \dots$		
$-64 + 32 - 16 + 8 - 4 + \dots$		

5. Write a formula for the sum of a convergent geometric series with first terms t_1 and common ratio r , where $|r| < 1$.