Level 1 Recall

Problem 1: Write the generic equations for recursive and explicit equations for both geometric and arithmetic sequences.

Recursive geometric:
$A(n) = A(n-1) * r$
$A(0) = \text{some number}$
$r = \text{multiplier}$

Problem 3: Provide the first 3 terms of the following sequences:

$a(0) = 4$, common difference of -2
$a(1) = 2$
$a(2) = 0$
$a(3) = -2$

$a(3) = 3$, common ratio of 2
$a(0) = \frac{3}{8}$
$a(1) = \frac{3}{4}$
$a(2) = \frac{3}{2}$

Reflection
I did Problem 3 using my own knowledge. For the first one, I just subtracted 2 from the 0th term each time. For the second one, I put the function in $f(x) = bm^x$ format: $3 = b(2)^3$ and solved for b to get the first (or 0th?) term.

Problem 6: Identify if the following equations are arithmetic or geometric and is it recursive or explicit

1. explicit arithmetic: $a(n) = 2n + 5$
2. recursive arithmetic: $a(n) = a(n-1) - 3, a(0) = 4$
3. explicit geometric: $a(n) = 3 * 2^n$
4. recursive geometric: $a(n) = a(n-1) * (-0.5), a(0) = 4$
5. arithmetic: $1, 7, 14, 21, 28, ...$
6. geometric: $32, 16, 8, 4, 2, ...$

For 5 and 6, can't tell if it's recursive or explicit since there's no equation

Reflection
I did problem 6 using my own knowledge and memory from calculus 2 and the lectures.

Problem 9: Why is factorial recursive?
Factorial is recursive because to get the answer, you have to multiply your current number by the number 1 less than it, or $n(n-1)!$. To get 3!, you must do $3*(3-1)!$, and then $3*2*(2-1)!$, and —like a recursive problem—you keep breaking down the problem into smaller, easier parts until you get to the smallest part, 0!

Reflection
I came up with this response on my own. However, I did use ChatGPT to ensure that what I was saying accurately describing the recursive nature of factorial. Link here