2. [9 points] Note: *"Closed form" here means that the expression should* NOT *include sigma notation or ellipses (. . .) and should* NOT *be recursive.*
In the live-action series adaptation of *Derivative Girl*, Derivative Girl can lift $D_0 = 1000$ kg, and she can make as many copies of herself as she wants. The first copy can lift 1/3 the amount Derivative Girl can lift, and the nth copy can lift 1/3 the amount the $(n-1)$st copy can lift.

a. [3 points] Let D_n be the amount of mass, in kg, that the nth copy of Derivative Girl can lift. Calculate D_1 and D_2, and give a closed-form expression for D_n in terms of n:

$D_1 =$ _____

$D_2 =$ _____

$D_n =$ _____

b. [4 points] Let G_n be the amount of mass, in kg, that Derivative Girl and the first n copies can lift together. Calculate G_1 and G_2, and give a closed-form expression for G_n:

$G_1 =$ _____

$G_2 =$ _____

$G_n =$ _____

c. [2 points] If Derivative Girl could make infinitely many copies, what is the largest amount, in kg, that Derivative Girl and her copies could lift together? Your answer should be a closed-form expression.

Answer: _____