

9. [11 points] Leight Vloss had trouble paying his rent so he started a cult. His followers believe that Leight receives holy messages from “The Great Consciousness” hiding in the internet. Each month Leight recruits D new followers and loses 20% of the followers he had in the previous month to disillusionment and other cults. That is, the number of followers Leight has after n months is described by the recursive formula

$$F_n = D + .8F_{n-1}$$

- a. [4 points] Supposing that Leight has 0 followers the moment he gets the idea to start a cult, which is to say that $F_0 = 0$, compute the number of followers he has in the first three months. Your answer may be in terms of D .

Answer: $F_1 =$ _____

$F_2 =$ _____

$F_3 =$ _____

- b. [4 points] Find a closed form expression for F_n , the number of followers Leight has after n months of channelling the spirit of the internet.

Answer: $F_n =$ _____

- c. [3 points] Leight finds he needs the number of followers to tend to 1000 in the long run to ensure he can make rent each month. What’s the fewest number of followers D that Leight Vloss needs to recruit each month to make sure he can pay rent?

Answer: _____