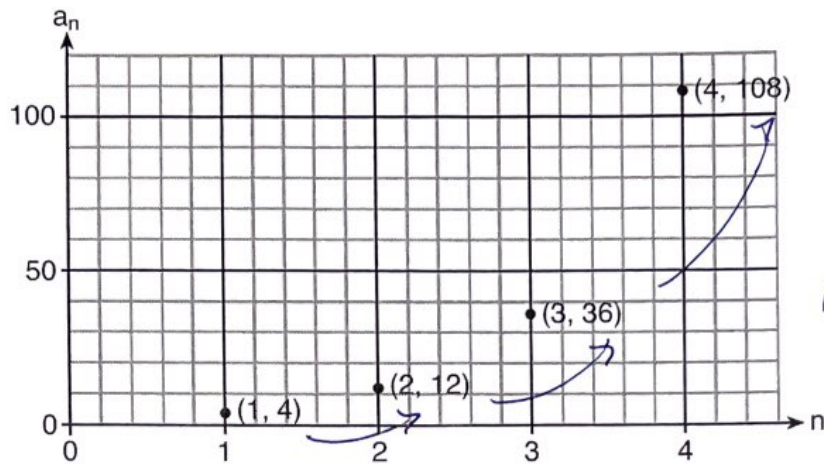


31 Write a recursive formula,  $a_n$ , to describe the sequence graphed below.



$$r = \frac{108}{36} = 3$$

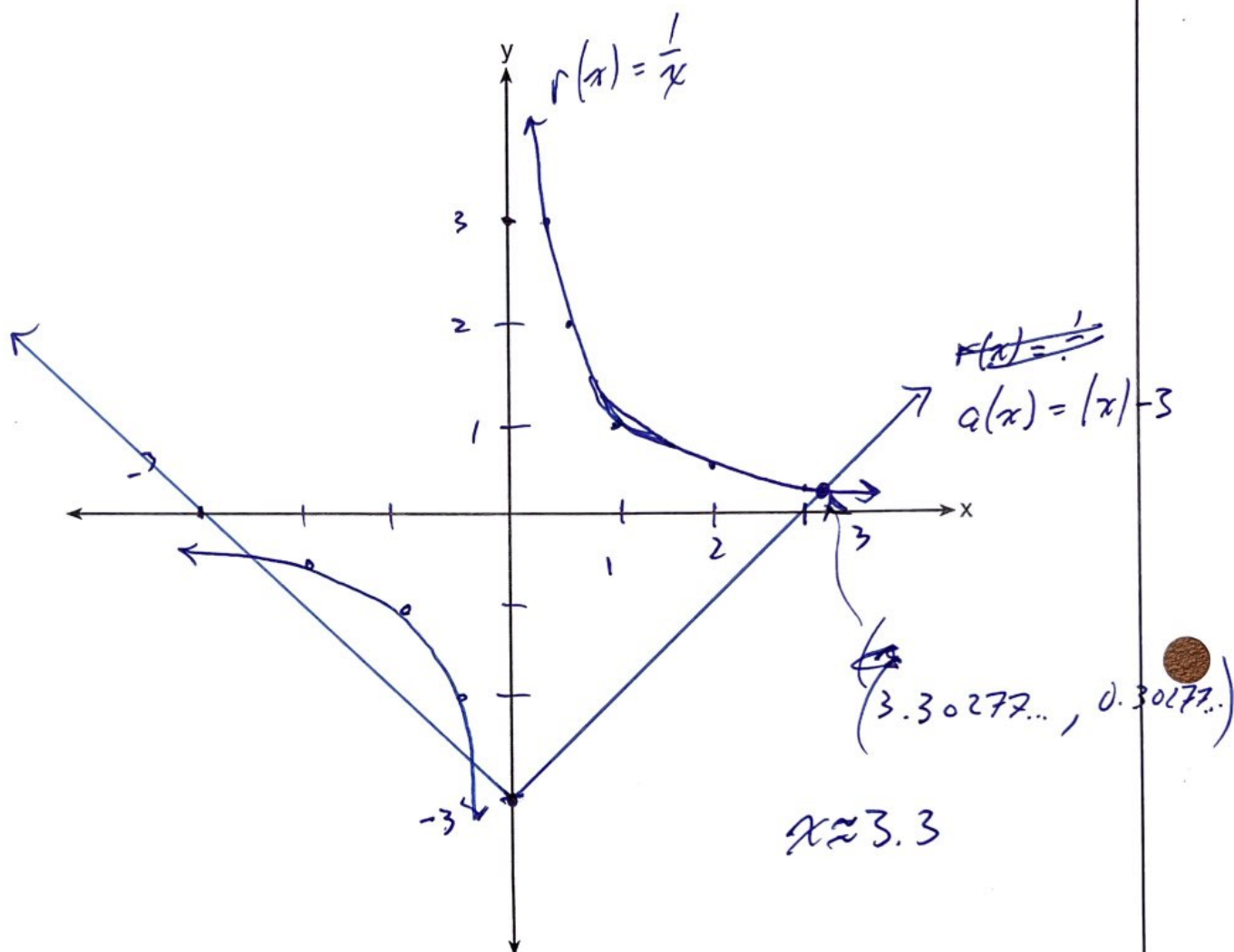
$$r = \frac{36}{12} = 3$$

$$r = \frac{12}{4} = 3$$

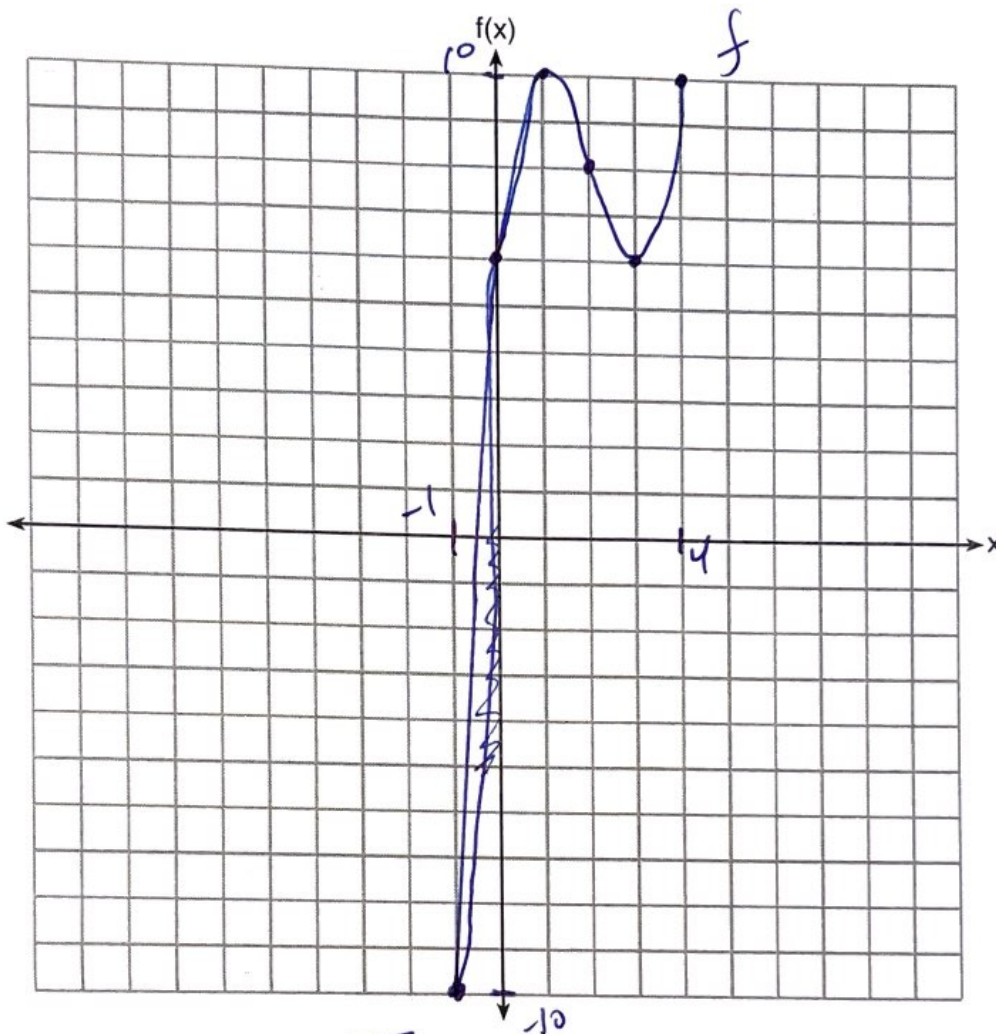
$$a_1 = 4$$

$$a_n = 3 a_{n-1}$$

- 32 Sketch the graphs of  $r(x) = \frac{1}{x}$  and  $a(x) = |x| - 3$  on the set of axes below. Determine, to the nearest tenth, the positive solution of  $r(x) = a(x)$ .



26 On the grid below, graph the function  $f(x) = x^3 - 6x^2 + 9x + 6$  on the domain  $-1 \leq x \leq 4$ .



no arrows  
closed circles on  
end points

# Part IV

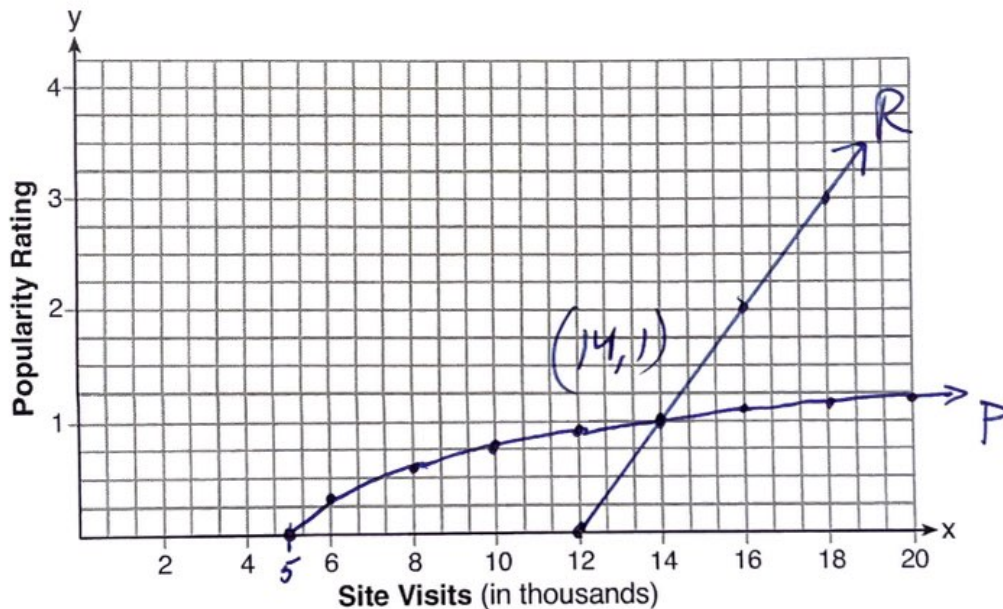
Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided to determine your answer. Note that diagrams are not necessarily drawn to scale. A correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

- 37 Website popularity ratings are often determined using models that incorporate the number of visits per week a website receives. One model for ranking websites is  $P(x) = \log(x - 4)$ , where  $x$  is the number of visits per week in thousands and  $P(x)$  is the website's popularity rating.

According to this model, if a website is visited 16,000 times in one week, what is its popularity rating, rounded to the nearest tenth?

$$\begin{aligned} P(16) &= \log(16 - 4) \\ &= 1.07918... \\ &\approx 1.1 \end{aligned}$$

Graph  $y = P(x)$  on the axes below.



An alternative rating model is represented by  $R(x) = \frac{1}{2}x - 6$ , where  $x$  is the number of visits per week in thousands. Graph  $R(x)$  on the same set of axes. For what number of weekly visits will the two models provide the same rating?

$$14,000$$