



# Sequences Stretch

283. \_\_\_\_\_ What is the 100th term of the arithmetic sequence 3, 11, 19, 27, ...?
284. \_\_\_\_\_ What is the sum of the first 100 terms of the arithmetic sequence 3, 11, 19, 27, ...?
285. \_\_\_\_\_ What is the 10th term of the geometric sequence 729, 243, 81, 27, ...? Express your answer as a common fraction.
286. \_\_\_\_\_ The 1st and 18th terms of an arithmetic sequence are 4 and 8.25, respectively. What is the 35th term of the sequence? Express your answer as a decimal to the nearest tenth.
287. \_\_\_\_\_ The first three terms of an arithmetic sequence are  $p$ ,  $2p + 6$  and  $5p - 12$ . What is the 4th term of this sequence?
288. \_\_\_\_\_ All terms in a geometric sequence are positive integers, and the first three terms are  $n$ ,  $n + 3$  and  $2n + 6$ . What is the 4th term of this sequence?
289. \_\_\_\_\_ The 3rd term of an arithmetic sequence is 17, and the 9th term is 83. What is the 1st term?
290. \_\_\_\_\_ The 2nd term of a geometric sequence is 24, and the 5th term is 81. What is the 1st term?
291. \_\_\_\_\_ The 6th term of an arithmetic sequence is 24. What is the sum of the 5th and 7th terms?
292. \_\_\_\_\_ cells The number of bacterial cells within a Petri dish doubles every hour. If there are 8 cells in the dish at the end of the 2nd hour, how many cells will be in the dish at the end of the 8th hour?



# Recursive Super Stretch

- \_\_\_\_\_ The arithmetic sequence 4, 7, 10, 13, ... can be expressed in recursive form as  $u_n = u_{n-1} + 3$ ,  $n \geq 2$ ,  $u_1 = 4$  and in function form as  $u_n = 4 + 3(n - 1)$ ,  $n \geq 1$ . Express 2, 7, 12, 17, ... in recursive form and in function form.  
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- \_\_\_\_\_ Express the geometric sequence 3, 6, 12, 24, 48, ... in recursive form and in function form.  
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- \_\_\_\_\_ Express  $u_n = u_{n-1} + n$ ,  $n \geq 2$ ,  $u_1 = 1$  in function form.
- \_\_\_\_\_ Express  $u_n = u_{n-1} \times n$ ,  $n \geq 2$ ,  $u_1 = 1$  in function form.
- \_\_\_\_\_ The Fibonacci sequence 1, 1, 2, 3, 5, 8, 13, ... can be expressed in recursive form as  $u_n = u_{n-1} + u_{n-2}$ ,  $n \geq 3$ ,  $u_1 = 1$ ,  $u_2 = 1$ . Express the sequence 1, 4, 5, 9, 14, 23, ... in recursive form.
- \_\_\_\_\_ Suppose we change the operation in the Fibonacci sequence to subtraction, so  $u_n = u_{n-1} - u_{n-2}$ ,  $n \geq 3$ ,  $u_1 = a$ ,  $u_2 = b$ . What is  $u_{25}$  in the three cases  $a = 2$ ,  $b = 3$ ;  $a = 5$ ,  $b = -2$ ; and  $a = -1$ ,  $b = -3$ ?  
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- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ Using the sequence  $u_n = u_{n-1} - u_{n-2}$ ,  $n \geq 3$ ,  $u_1 = c$ ,  $u_2 = d$ , from problem number 6, what are the next five terms in  $c$ ,  $d$ ,  $d - c$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...?
- \_\_\_\_\_ Now suppose we change the operation in the Fibonacci sequence to division, so  $u_n = \frac{u_{n-1}}{u_{n-2}}$ ,  $n \geq 3$ ,  $u_1 = a$ ,  $u_2 = b$ . What is  $u_{25}$  in these three cases:  $a = 4$ ,  $b = 8$ ;  $a = -2$ ,  $b = 6$ ; and  $a = 5$ ,  $b = -10$ ?  
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- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ Using the sequence  $u_n = \frac{u_{n-1}}{u_{n-2}}$ ,  $n \geq 3$ ,  $u_1 = C$ ,  $u_2 = D$ , from problem number 8, what are the next five terms in  $C$ ,  $D$ ,  $\frac{D}{C}$ , \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...?
- \_\_\_\_\_ Consider the sequence  $v_n = \frac{1 + v_{n-1}}{v_{n-2}}$ ,  $n \geq 3$ ,  $v_1 = a$ ,  $v_2 = b$ . What is  $v_{27}$  in the three cases  $a = 3$ ,  $b = 5$ ;  $a = 2$ ,  $b = -5$ ; and  $a = -4$ ,  $b = 7$ ?  
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