

ALGEBRA 2 (LESSON 12.2)

How is the following sequence different from what we were looking at yesterday?

n	1	2	3	4	5
f _n	3a	16	8	4	a

GEOMETRIC SEQUENCE - the RATIO of any term to the previous term is constant (common ratio)

Recursive Formula: $f(1) = 3a, f(n) = \frac{1}{2}f(n-1), n > 1$

Explicit Formula: $f(n) = 3a\left(\frac{1}{2}\right)^{n-1}$ (REMEMBER: you can choose any point)

Given the following sequence, find the Recursive and Explicit formulas and answer the following questions.

n	0	1	2	3	4
f(n)	3	3√7	21	147	147

Recursive: $f(0) = 3, f(n) = \sqrt{7}f(n-1), n > 0$

Explicit: $f(n) = 3(\sqrt{7})^{n-0}$

$$f(n) = 3(\sqrt{7})^n$$

Ⓐ. Is $987\sqrt{7}$ a part of the sequence?

$$987\sqrt{7} = 3(\sqrt{7})^n$$

$$329\sqrt{7} = (\sqrt{7})^n$$

$$\log(329\sqrt{7}) = n \log(\sqrt{7})$$

$$\log 329 + \log \sqrt{7} = n \log \sqrt{7}$$

Ⓑ. Find the first term to exceed 5000.

$$5000 = 3(\sqrt{7})^n$$

$$\frac{5000}{3} = (\sqrt{7})^n$$

$$\log \frac{5000}{3} = n \log(\sqrt{7})$$

$$n = 7.625$$

8th term

You invest \$4,000 compounded monthly at 8.0% APR for 5 years.

(A). Is this geometric?

$$V(t) = 4000 \left(1 + \frac{0.08}{12}\right)^{5 \cdot 12}$$

YES

(B). What is the growth measure? $\left(1 + \frac{0.08}{12}\right)$

(C). Find the 17th term in the sequence?

$$f(17) = 4000 \left(1 + \frac{0.08}{12}\right)^{17-0}$$

$$= 4000 \left(1 + \frac{0.08}{12}\right)^{17}$$

$$= 4478.34$$

$$f(17) = \$4,478.34 \quad (17^{\text{th}} \text{ compound of investment})$$

↓
month