

11.5 Recursive Rules for Sequences

std. 22.0

explicit rule gives a_n in terms of n (use a_n formulas)

recursive rule gives a_n using previous term or terms

$\dots, a_{n-2}, a_{n-1}, a_n \star$

ex. 1 Give the 1st 5 terms of each sequence:

a) $a_1 = 1$, $a_n = (a_{n-1})^2 + 1$

1st: $a_1 = 1$
 2nd, 3rd, ...: $a_2 = (a_1)^2 + 1$

① ② 5 26 677
 $1^2 + 1$, $(2)^2 + 1$, $5^2 + 1$, $26^2 + 1$

b) $a_0 = 2$, $a_1 = 2$, $a_n = .5(a_{n-2}) + a_{n-1}$

1st 2nd 3rd etc

② ② 3 4 5.5
 $.5(2) + 2$, $.5(2) + 2$, $.5(3) + 4$

ex. 2 Write a recursive rule for

a) 17, ^{x2}34, ^{x2}68, . . .

$$a_1 = 17, a_n = 2(a_{n-1})$$

b) 1, 1, 2, 3, 5, . . .

$$a_1 = 1, a_2 = 1, a_n = a_{n-2} + a_{n-1}$$

ex. 3 Write an explicit rule and a recursive rule:

a) $a_1 = 15, d = 5$

explicit $a_n = a_1 + (n-1)d$

$$a_n = 15 + (n-1)5$$

$$a_n = 5n + 10$$

recursive $\begin{cases} a_1 = 15 \\ a_n = a_{n-1} + 5 \end{cases}$

~~b) $a_1 = 4, r = 0.2$~~