

Name Schlansky
Mr. Schlansky

Arithmetic (add)
 $a_n = a_1 + (n-1)d$

Geometric (multiply)
 $a_n = a_1(r)^{n-1}$ Date _____
Algebra II

Writing Equations of Sequences Explicitly

1. Write an explicit equation for the following sequence and use the equation to find the tenth term.

$d = a_2 - a_1$
 $d = 3 - (-1)$
 $d = 4$
 $a_1 = -1$
 $d = 4$

+4 arithmetic
-1, 3, 7, 11, ...

$a_n = a_1 + (n-1)d$
 $a_n = -1 + (n-1)4$

$a_n = -1 + 4n - 4$
 $a_n = 4n - 5$

$a_{10} = 4(10) - 5$
 $a_{10} = 35$

2. Write an explicit equation for the following sequence and use the equation to find the tenth term.

$d = a_2 - a_1$
 $d = 16 - 19$
 $d = -3$
 $a_1 = 19$
 $d = -3$

-3 arithmetic
19, 16, 13, 10, ...

$a_n = a_1 + (n-1)d$
 $a_n = 19 + (n-1)(-3)$

$a_n = 19 - 3n + 3$
 $a_n = -3n + 22$

$a_{10} = -3(10) + 22$
 $a_{10} = -8$

3. Write an explicit equation for the following sequence and use the equation to find the tenth term.

$r = \frac{a_2}{a_1}$
 $r = \frac{8}{2}$
 $r = 4$
 $a_1 = 2$
 $r = 4$

•4 geometric
2, 8, 32, 128, ...

$a_n = a_1(r)^{n-1}$
 $a_n = 2(4)^{n-1}$

$a_{10} = 2(4)^{10-1}$
 $a_{10} = 524288$

4. Write an explicit equation for the following sequence and use the equation to find the tenth term.

$d = a_2 - a_1$
 $d = -503 - (-509)$
 $d = 6$
 $a_1 = -509$

+6 arithmetic
-509, -503, -497, -491, ...

$a_n = a_1 + (n-1)d$
 $a_n = -509 + (n-1)6$
 $a_n = -509 + 6n - 6$
 $a_n = 6n - 515$

$a_{10} = 6(10) - 515$
 $a_{10} = -455$

5. Write an explicit equation for the following sequence and use the equation to find the fifteenth term.

$r = \frac{a_2}{a_1}$
 $r = \frac{-10}{5}$
 $r = -2$
 $a_1 = 5$

•-2 geometric
5, -10, 20, -40, 80, ...

$a_n = a_1(r)^{n-1}$
 $a_n = 5(-2)^{n-1}$

$a_{15} = 81920$

6. Write an explicit equation for the following sequence and use the equation to find the twelfth term.

11, 14, 17, 20, 23, ... $+3$ arithmetic

$$a_1 = 11 \quad d = a_2 - a_1 \quad a_n = a_1 + (n-1)d$$

$$d = 14 - 11 \quad a_n = 11 + (n-1)3$$

$$d = 3 \quad a_n = 11 + 3n - 3$$

$$a_n = 3n + 8$$

$$a_{12} = 3(12) + 8$$

$$a_{12} = 44$$

7. Write an explicit equation for the following sequence and use the equation to find the ninth term.

2, 6, 18, 54, ... $\cdot 3$ geometric

$$a_1 = 2 \quad r = \frac{a_2}{a_1}$$

$$r = \frac{6}{2}$$

$$r = 3$$

$$a_n = a_1(r)^{n-1}$$

$$a_n = 2(3)^{n-1}$$

$$a_9 = 2(3)^{9-1}$$

$$a_9 = 13122$$

8. Write an explicit equation for the following sequence and use the equation to find the 22nd term.

63, 57, 51, 45, ... -6 arithmetic

$$a_1 = 63 \quad d = a_2 - a_1$$

$$d = 57 - 63$$

$$d = -6$$

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

$$a_n = 63 + (n-1)(-6)$$

$$a_n = 63 - 6n + 6$$

$$a_n = -6n + 69$$

$$a_{22} = -6(22) + 69$$

$$a_{22} = -63$$

9. Write an explicit equation for the following sequence and use the equation to find the 15th term.

3, -12, 48, -192, ... $\cdot -4$ geometric

$$a_1 = 3 \quad r = \frac{a_2}{a_1}$$

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

$$r = -4$$

$$a_n = a_1(r)^{n-1}$$

$$a_n = 3(-4)^{n-1}$$

$$a_{15} = 3(-4)^{15-1}$$

$$a_{15} = 805306368$$

10. Write an explicit equation for the following sequence and use the equation to find the 7th term.

-5, -15, -45, -135, ... $\cdot 3$ geometric

$$a_1 = -5 \quad r = \frac{a_2}{a_1}$$

$$r = \frac{-15}{-5}$$

$$r = 3$$

$$a_n = a_1(r)^{n-1}$$

$$a_n = -5(3)^{n-1}$$

$$a_7 = -5(3)^{7-1}$$

$$a_7 = -3645$$

11. Write an explicit equation for the following sequence and use the equation to find the 30th term.

-99, -92, -85, -78, ... $+7$ arithmetic

$$a_1 = -99 \quad d = a_2 - a_1$$

$$d = -92 - (-99)$$

$$d = 7$$

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

$$a_n = -99 + (n-1)7$$

$$a_n = -99 + 7n - 7$$

$$a_n = 7n - 106$$

$$a_{30} = 7(30) - 106$$

$$a_{30} = 104$$