

## Arithmetic Sequences

Determine if the sequence is arithmetic. If it is, find the common difference.

1) 35, 32, 29, 26, ...

$d = -3$

2) -3, -23, -43, -63, ...

$d = -20$

3) -34, -64, -94, -124, ...

$d = -30$

4) -30, -40, -50, -60, ...

$d = -10$

5) -7, -9, -11, -13, ...

$d = -2$

6) 9, 14, 19, 24, ...

$d = 5$

Given the explicit formula for an arithmetic sequence find the first five terms and the term named in the problem.

7)  $a_n = -11 + 7n$

Find  $a_{34}$ 

$-4, 3, 10, 17, 24$

$a_{34} = -11 + 7(34) = 227$

8)  $a_n = 65 - 100n$

Find  $a_{39}$ 

$-35, -135, -235, -335, -435$

$a_{39} = -3835$

9)  $a_n = -7.1 - 2.1n$

Find  $a_{27}$ 

$-9.2, -11.3, -13.4, -15.5, -17.6$

$a_{27} = -63.8$

10)  $a_n = \frac{11}{8} + \frac{1}{2}n$

Find  $a_{23}$ 

$\frac{15}{8}, \frac{19}{8}, \frac{23}{8}, \frac{27}{8}, \frac{31}{8}$

$a_{23} = \frac{103}{8}$

Given the first term and the common difference of an arithmetic sequence find the first five terms and the explicit formula.

11)  $a_1 = 28, d = 10$

$28, 38, 48, 58, 68$

$a_n = 18 + 10n$  or  $a_n = 28 + 10(n-1)$

13)  $a_1 = -34, d = -10$

$-34, -44, -54, -64, -74$

$a_n = -24 - 10n$

12)  $a_1 = -38, d = -100$

$-38, -138, -238, -338, -438$

$a_n = 62 - 100n$

14)  $a_1 = 35, d = 4$

$35, 39, 43, 47, 51$

$a_n = 31 + 4n$

Given a term in an arithmetic sequence and the common difference find the first five terms and the explicit formula.

15)  $a_{38} = -53.2, d = -1.1$

$a_1 = (1.1)(38) = -53.2$

$a_1 = -11.4 \quad -12.5, -13.6, -14.7, -15.8$

$a_n = -11.4 - 1.1n$

17)  $a_{37} = 249, d = 8$

$a_1 + 8(37) = 249$

$a_1 = -47$

$-39, -31, -23, -15, -7$

$a_n = -47 + 8n$

16)  $a_{40} = -1191, d = -30$

$a_1 - 30(40) = -1191$

$a_1 = 9$

$-21, -51, -81, -111, -141$

$a_n = 9 - 30n$

18)  $a_{36} = -276, d = -7$

$a_1 - 7(36) = -276$

$a_1 = -24$

$-31, -38, -45, -52, -59$

$a_n = -24 - 7n$

Given the first term and the common difference of an arithmetic sequence find the recursive formula and the three terms in the sequence after the last one given.

19)  $a_1 = \frac{3}{5}, d = -\frac{1}{3}$

$\begin{cases} a_1 = \frac{3}{5} \\ a_n = a_{n-1} - \frac{1}{3} \end{cases}$

$\frac{4}{15}, -\frac{1}{15}, -\frac{2}{15}$

20)  $a_1 = 39, d = -5$

$\begin{cases} a_1 = 39 \\ a_n = a_{n-1} - 5 \end{cases}$

$34, 29, 24$

21)  $a_1 = -26, d = 200$

$\begin{cases} a_1 = -26 \\ a_n = a_{n-1} + 200 \end{cases}$

$174, 374, 574$

22)  $a_1 = -9.2, d = 0.9$

$\begin{cases} a_1 = -9.2 \\ a_n = a_{n-1} + 0.9 \end{cases}$

$-8.3, -7.4, -6.5$

Given a term in an arithmetic sequence and the common difference find the recursive formula and the three terms in the sequence after the last one given.

23)  $a_{21} = -1.4, d = 0.6$

$a_1 + 20(0.6) = -1.4$

$\begin{cases} a_1 = -13.4 \\ a_n = a_{n-1} + 0.6 \end{cases}$

24)  $a_{22} = -44, d = -2$

$a_1 - (21)(2) = -44$

$\begin{cases} a_1 = -2 \\ a_n = a_{n-1} - 2 \end{cases}$

25)  $a_{18} = 27.4, d = 1.1$

$a_1 + (17)(1.1) = 27.4$

$\begin{cases} a_1 = 8.7 \\ a_n = a_{n-1} + 1.1 \end{cases}$

26)  $a_{12} = 28.6, d = 1.8$

$a_1 + 11(1.8) = 28.6$

$\begin{cases} a_1 = 8.8 \\ a_n = a_{n-1} + 1.8 \end{cases}$

Given two terms in an arithmetic sequence find the recursive formula.

27)  $a_{18} = 3362$  and  $a_{38} = 7362$

$d = \frac{7362 - 3362}{38 - 18} = 200$

$\begin{cases} a_1 = -38 \\ a_n = a_{n-1} + 200 \end{cases}$

28)  $a_{18} = 44.3$  and  $a_{33} = 84.8$

$d = \frac{84.8 - 44.3}{33 - 18} = 2.7$

$\begin{cases} a_1 = -1.6 \\ a_n = a_{n-1} + 2.7 \end{cases}$