

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}

First Five Terms: -4, 3, 10, 17, 24

$a_{34} = 227$

8) $a_n = 65 - 100n$

Find a_{39}

First Five Terms: -35, -135, -235, -335, -435

$a_{39} = -3835$

9) $a_n = -7.1 - 2.1n$

Find a_{27}

First Five Terms: -9.2, -11.3, -13.4, -15.5, -17.6

$a_{27} = -63.8$

10) $a_n = \frac{11}{8} + \frac{1}{2}n$ First Five Terms: $\frac{15}{8}, \frac{19}{8}, \frac{23}{8}, \frac{27}{8}, \frac{31}{8}$

Find a_{23}

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

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

11) $a_1 = 28, d = 10$

First Five Terms: 28, 38, 48, 58, 68

Explicit: $a_n = 18 + 10n$

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

First Five Terms: -38, -138, -238, -338, -438

Explicit: $a_n = 62 - 100n$

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

First Five Terms: -34, -44, -54, -64, -74

Explicit: $a_n = -24 - 10n$

14) $a_1 = 35, d = 4$

First Five Terms: 35, 39, 43, 47, 51

Explicit: $a_n = 31 + 4n$

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

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

First Five Terms: $-12.5, -13.6, -14.7, -15.8, -16.9$
 Explicit: $a_n = -11.4 - 1.1n$

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

First Five Terms: $-21, -51, -81, -111, -141$
 Explicit: $a_n = 9 - 30n$

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

First Five Terms: $-39, -31, -23, -15, -7$
 Explicit: $a_n = -47 + 8n$

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

First Five Terms: $-31, -38, -45, -52, -59$
 Explicit: $a_n = -24 - 7n$

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) $a_1 = \frac{3}{5}, d = -\frac{1}{3}$ Next 3 terms: $\frac{4}{15}, -\frac{1}{15}, -\frac{2}{5}$

Recursive: $a_n = a_{n-1} - \frac{1}{3}$
 $a_1 = \frac{3}{5}$

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

Next 3 terms: $34, 29, 24$
 Recursive: $a_n = a_{n-1} - 5$
 $a_1 = 39$

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

Next 3 terms: $174, 374, 574$
 Recursive: $a_n = a_{n-1} + 200$
 $a_1 = -26$

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

Next 3 terms: $-8.3, -7.4, -6.5$
 Recursive: $a_n = a_{n-1} + 0.9$
 $a_1 = -9.2$

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

Next 3 terms: $-0.8, -0.2, 0.4$
 Recursive: $a_n = a_{n-1} + 0.6$
 $a_1 = -13.4$

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

Next 3 terms: $-46, -48, -50$
 Recursive: $a_n = a_{n-1} - 2$
 $a_1 = -2$

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

Next 3 terms: $28.5, 29.6, 30.7$
 Recursive: $a_n = a_{n-1} + 1.1$
 $a_1 = 8.7$

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

Next 3 terms: $30.4, 32.2, 34$
 Recursive: $a_n = a_{n-1} + 1.8$
 $a_1 = 8.8$

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

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

$a_n = a_{n-1} + 200$
 $a_1 = -38$

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

$a_n = a_{n-1} + 2.7$
 $a_1 = -1.6$

Arithmetic Series

Evaluate the related series of each sequence.

1) 13, 15, 17, 19, 21, 23

108

2) 6, 11, 16, 21, 26, 31, 36

147

3) 22, 28, 34, 40, 46

170

4) 39, 49, 59, 69

216

Evaluate each arithmetic series described.

5) $\sum_{k=1}^{35} (5k - 2)$

3080

6) $\sum_{i=1}^{35} (3i - 13)$

1435

7) $\sum_{m=1}^{15} 4m$

480

8) $\sum_{m=1}^{10} (7m - 2)$

365

9) $\sum_{i=1}^6 3i$

63

10) $\sum_{n=1}^{45} (3n - 9)$

2700

11) $a_1 = 42, a_n = 146, n = 14$

1316

12) $a_1 = 4, a_n = 22, n = 10$

130

13) $a_1 = 2, a_n = 122, n = 13$

806

14) $a_1 = -18, a_n = -102, n = 13$

-780

15) $20 + 27 + 34 + 41 \dots, n = 16$

1160

16) $20 + 30 + 40 + 50 \dots, n = 15$

1350

17) $7 + 9 + 11 + 13 \dots, n = 10$

160

18) $10 + 12 + 14 + 16 \dots, n = 11$

220

Determine the number of terms n in each arithmetic series.

19) $a_1 = 19, a_n = 96, S_n = 690$

12

20) $a_1 = 16, a_n = 163, S_n = 4475$

50

21) $a_1 = 19, a_n = 118, S_n = 822$

12

22) $a_1 = 15, a_n = 79, S_n = 423$

9

23) $a_1 = -3, d = 2, S_n = 21$

7

24) $a_1 = 4, d = 7, S_n = 228$

8

25) $(-2) + (-12) + (-22) + (-32) \dots, S_n = -224$

7

26) $(-16) + (-26) + (-36) + (-46) \dots, S_n = -1818$

18