Arithmetic and Geometric Sequences, Series … Set 3

Sequences/Series Test Practice

If the sequence is arithmetic or geometric, find the next 3 terms.

1) $-5, -\frac{5}{4}, -\frac{5}{16}, -\frac{5}{64}, -\frac{5}{256}, \ldots$

2) $1, 3, 6, 10, 15, \ldots$

3) $-11, 89, 189, 289, 389, \ldots$

4) $-38, -36, -34, -32, -30, \ldots$

Given the first term and the common difference of an arithmetic sequence find the term named in the problem.

5) $a_1 = -9, \ d = 2$
Find a_{20}

6) $a_1 = -14, \ d = -10$
Find a_{38}

Find the missing term or terms in each arithmetic sequence.

7) ..., -20, ___, ___, ___, 0, ...

8) ..., 26, ___, ___, ___, ___, 41, ...

Given the first term and the common ratio of a geometric sequence find the term named in the problem.

9) $a_1 = -4, \ r = -2$
Find a_{10}

10) $a_1 = 2, \ r = -2$
Find a_{11}

Find the missing term or terms in each geometric sequence.

11) ..., -1, ___, ___, ___, -256, ...

12) ..., -2, ___, ___, ___, ___, -2048, ...

Evaluate each arithmetic series described.

13) $\sum_{k=2}^{8} (2k + 7)$

14) $\sum_{i=3}^{10} (5 - 3i)$

15) $a_1 = 16, \ d = 3, \ n = 5$

16) $a_1 = 7, \ d = 7, \ n = 45$

17) $6 + 8 + 10 + 12..., \ n = 7$

18) $(-2) + 2 + 6 + 10..., \ n = 19$

Arithmetic and Geometric Sequences, Series … Set 3

Answers

Sequences/Series Test Practice

1) $-\frac{5}{1024}, -\frac{5}{4096}, -\frac{5}{16384}$ 2) 21, 28, 36 3) 489, 589, 689

4) −28, −26, −24 5) $a_{20} = 29$ 6) $a_{38} = -384$ 7) −15, −10, −5

8) 29, 32, 35, 38 9) $a_{10} = 2048$ 10) $a_{11} = 2048$

11) −4, −16, −64 or 4, -16, 64 12) −8, −32, −128, −512 13) 119

14) −116 15) 110 16) 7245 17) 84

18) 646

Arithmetic and Geometric Sequences, Series … Set 3

Determine the number of terms n in each arithmetic series.

19) $a_1 = 26,\ a_n = 166,\ S_n = 1440$

20) $a_1 = 10,\ a_n = 451,\ S_n = 11525$

Evaluate each geometric series described.

21) $-3 + 15 - 75 + 375...,\ n = 6$

22) $1 + 5 + 25 + 125...,\ n = 8$

23) $\sum_{i=1}^{9} -2 \cdot \left(\frac{1}{5}\right)^{i-1}$

24) $\sum_{i=1}^{7} 2 \cdot (-6)^{i-1}$

Evaluate each infinite geometric series described.

25) $\sum_{m=1}^{\infty} 108 \cdot \left(-\frac{4}{3}\right)^{m-1}$

26) $\sum_{n=1}^{\infty} -2 \cdot \left(\frac{1}{2}\right)^{n-1}$

27) $6 - \frac{3}{2} + \frac{3}{8} - \frac{3}{32}...$

28) $2 - \frac{2}{3} + \frac{2}{9} - \frac{2}{27}...$

Determine the number of terms n in each geometric series.

29) $a_1 = -2,\ r = -6,\ S_n = 13330$

30) $a_1 = -3,\ r = -6,\ S_n = 555$

Given the recursive formula for an arithmetic sequence find the first five terms.

31) $a_{n+1} = a_n + n$
$a_1 = 7$

32) $a_{n+1} = a_n - a_{n+1}$
$a_1 = 2$
$a_2 = 3$

33) $a_{n+1} = a_n + n$
$a_1 = 3$

34) $a_{n+1} = a_n + n$
$a_1 = -10$

35) $a_{n+1} = a_n + n$
$a_1 = -9$

36) $a_{n+1} = a_n + 9$
$a_1 = -13$

37) $a_{n+1} = a_n \cdot 4$
$a_1 = -2$

38) $a_{n+1} = a_n \cdot -5$
$a_1 = 3$

Answers

Sequences/Series Test Practice

19) 15

20) 50

21) 7812

22) 97656

23) $-\frac{976562}{390625}$

24) 79982

25) No sum

26) –4

27) $\frac{24}{5}$

28) $\frac{3}{2}$

29) 6

30) 4

31) 7, 12, 17, 22, 27

32) 2, 3, -1, 4, -5

33) 3, 5, 8, 12

34) –10, –8, –5, –1

35) –9, –7, –4, 0

36) –13, –4, 5, 14

37) –2, –8, –32, –128, –512

38) 3, –15, 75, –375, 1875

Arithmetic and Geometric Sequences, Series … Set 3

Sequences/Series Test Practice

If the sequence is arithmetic or geometric, find the next 3 terms.

1) 4, −8, 16, −32, 64, ...

2) $3, \frac{5}{4}, \frac{7}{9}, \frac{9}{16}, \frac{11}{25}, \ldots$

3) 3, 15, 75, 375, 1875, ...

4) 1, 4, 9, 16, 25, ...

Given the first term and the common difference of an arithmetic sequence find the term named in the problem.

5) $a_1 = 6,\ d = 2$
Find a_{22}

6) $a_1 = -39,\ d = -3$
Find a_{39}

Find the missing term or terms in each arithmetic sequence.

7) ..., 32, ___, ___, ___, 8, ...

8) ..., 1, ___, ___, ___, ___, 501, ...

Given the first term and the common ratio of a geometric sequence find the term named in the problem.

9) $a_1 = -1,\ r = -2$
Find a_{11}

10) $a_1 = -4,\ r = 3$
Find a_{11}

Find the missing term or terms in each geometric sequence.

11) ..., 2, ___, ___, ___, ___, 15552, ...

12) ..., 3, ___, ___, ___, ___, 9375, ...

Evaluate each arithmetic series described.

13) $\sum_{k=3}^{10} (7k - 12)$

14) $\sum_{m=5}^{10} (8m - 5)$

15) $a_1 = -10,\ d = -10,\ n = 13$

16) $a_1 = 6,\ d = -2,\ n = 9$

17) $(-4) + (-2) + 0 + 2\ldots,\ n = 8$

18) $17 + 20 + 23 + 26\ldots,\ n = 7$

Determine the number of terms *n* in each arithmetic series.

19) $a_1 = 5,\ a_n = 65,\ S_n = 455$

20) $a_1 = 15,\ a_n = 35,\ S_n = 150$

Arithmetic and Geometric Sequences, Series … Set 3

Answers

Sequences/Series Test Practice

1) $-128,\ 256,\ -512$

2) $\frac{13}{36}, \frac{15}{49}, \frac{17}{64}$

3) $9375,\ 46875,\ 234375$

4) $36,\ 49,\ 64$

5) $a_{22} = 48$

6) $a_{39} = -153$

7) $26,\ 20,\ 14$

8) $101,\ 201,\ 301,\ 401$

9) $a_{11} = -1024$

10) $a_{11} = -236196$

11) $12,\ 72,\ 432,\ 2592$

12) $15,\ 75,\ 375,\ 1875$

13) 268

14) 330

15) -910

16) -18

17) 24

18) 182

19) 13

20) 6

Arithmetic and Geometric Sequences, Series … Set 3

Evaluate each geometric series described.

21) $-4 - 24 - 144 - 864..., \ n = 6$

22) $-\frac{1}{4} + \frac{1}{8} - \frac{1}{16} + \frac{1}{32}..., \ n = 7$

23) $\sum_{n=1}^{9} 4^{n-1}$

24) $\sum_{m=1}^{8} 5^{m-1}$

Evaluate each infinite geometric series described.

25) $\sum_{m=1}^{\infty} \frac{27}{32} \cdot \left(\frac{4}{3}\right)^{m-1}$

26) $\sum_{n=1}^{\infty} -\frac{27}{2} \cdot \left(\frac{2}{3}\right)^{n-1}$

27) $3 + \frac{3}{4} + \frac{3}{16} + \frac{3}{64}...$

28) $-1.3 - 1.04 - 0.832 - 0.6656...$

Determine the number of terms *n* in each geometric series.

29) $a_1 = -4, \ r = -6, \ S_n = -124$

30) $a_1 = -1, \ r = 2, \ S_n = -7$

Given the recursive formula for an arithmetic sequence find the first five terms.

31) $a_{n+1} = a_n - 7$
$a_1 = -40$

32) $a_{n+1} = a_n - 2$
$a_1 = 30$

33) $a_{n+1} = \frac{2 + a_n}{2}$
$a_1 = -22$

34) $a_{n+1} = a_n + n$
$a_1 = -6$

35) $a_{n+1} = a_n \cdot 2$
$a_1 = 1$

36) $a_{n+1} = na_n$
$a_1 = -1$

37) $a_{n+1} = a_n \cdot -4$
$a_1 = 1$

38) $a_{n+1} = a_n \cdot -5$
$a_1 = -3$

Answers

Sequences/Series Test Practice

21) -37324

22) $-\frac{43}{256}$

23) 87381

24) 97656

25) No sum

26) $-\frac{81}{2}$

27) 4

28) -6.5

29) 3

30) 3

31) $-40, -47, -54, -61, -68$

32) $30, 28, 26, 24, 22$

33) $-22, -10, -4, -1$

34) $-6, -4, -1, 3$

35) $1, 2, 4, 8$

36) $-1, -2, -6, -24$

37) $1, -4, 16, -64, 256$

38) $-3, 15, -75, 375, -1875$

Arithmetic and Geometric Sequences, Series … Set 3

Sequences/Series Test Practice

If the sequence is arithmetic or geometric, find the next 3 terms.

1) 4, 16, 36, 64, 100, ...

2) 6.2, 9.1, 12, 14.9, 17.8, ...

3) $-\frac{1}{3}, \frac{7}{6}, \frac{8}{3}, \frac{25}{6}, \frac{17}{3}, \ldots$

4) $3, -\frac{3}{5}, \frac{3}{25}, -\frac{3}{125}, \frac{3}{625}, \ldots$

Given the first term and the common difference of an arithmetic sequence find the term named in the problem.

5) $a_1 = 7,\ d = -3$
Find a_{20}

6) $a_1 = -38,\ d = -4$
Find a_{20}

Find the missing term or terms in each arithmetic sequence.

7) ..., 33, ___, ___, ___, ___, 83, ...

8) ..., −39, ___, ___, ___, ___, −79, ...

Given the first term and the common ratio of a geometric sequence find the term named in the problem.

9) $a_1 = -2,\ r = -3$
Find a_{12}

10) $a_1 = 2,\ r = -2$
Find a_{12}

Find the missing term or terms in each geometric sequence.

11) ..., −3, ___, ___, ___, −243, ...

12) ..., 3, ___, ___, ___, ___, 3072, ...

Evaluate each arithmetic series described.

13) $\sum_{m=2}^{7} (16 - 9m)$

14) $\sum_{m=3}^{11} (1 - 8m)$

15) $a_1 = 30,\ d = 6,\ n = 15$

16) $a_1 = 33,\ d = 9,\ n = 11$

17) $18 + 28 + 38 + 48\ldots,\ n = 20$

18) $25 + 34 + 43 + 52\ldots,\ n = 10$

Determine the number of terms n in each arithmetic series.

19) $a_1 = 32,\ a_n = 344,\ S_n = 7520$

20) $a_1 = 10,\ a_n = 58,\ S_n = 238$

Arithmetic and Geometric Sequences, Series … Set 3

Answers

Sequences/Series Test Practice

1) 144, 196, 256

2) 20.7, 23.6, 26.5

3) $\frac{43}{6}, \frac{26}{3}, \frac{61}{6}$

4) $-\frac{3}{3125}, \frac{3}{15625}, -\frac{3}{78125}$

5) $a_{20} = -50$

6) $a_{20} = -114$

7) 43, 53, 63, 73

8) −47, −55, −63, −71

9) $a_{12} = 354294$

10) $a_{12} = -4096$

11) −9, −27, −81

12) 12, 48, 192, 768

13) −147

14) −495

15) 1080

16) 858

17) 2260

18) 655

19) 40

20) 7

Arithmetic and Geometric Sequences, Series … Set 3

Evaluate each geometric series described.

21) $2-\frac{2}{3}+\frac{2}{9}-\frac{2}{27}...,\ n=7$

22) $-2-10-50-250...,\ n=7$

23) $\sum_{m=1}^{7} 3^{m-1}$

24) $\sum_{k=1}^{10} 3^{k-1}$

Evaluate each infinite geometric series described.

25) $\sum_{m=1}^{\infty} -9.1 \cdot 0.2^{m-1}$

26) $\sum_{i=1}^{\infty} 7.7 \cdot (-0.6)^{i-1}$

27) $-\frac{6}{5}+\frac{2}{5}-\frac{2}{15}+\frac{2}{45}...$

28) $5.9 + 9.44 + 15.104 + 24.1664...$

Determine the number of terms *n* in each geometric series.

29) $a_1 = 4,\ r = -4,\ S_n = 52$

30) $a_1 = -1,\ r = -5,\ S_n = 104$

Given the recursive formula for an arithmetic sequence find the first five terms.

31) $a_{n+1} = a_n + 100$
$a_1 = 6$

32) $a_{n+1} = a_n + 3$
$a_1 = -21$

33) $a_{n+1} = a_n + 7$
$a_1 = 11$

34) $a_{n+1} = a_n + 4$
$a_1 = 35$

35) $a_{n+1} = na_n$
$a_1 = 1$

36) $a_{n+1} = a_n + \frac{3}{2}$
$a_1 = -\frac{12}{7}$

37) $a_{n+1} = a_n \cdot -4$
$a_1 = 1$

38) $a_{n+1} = a_n \cdot -5$
$a_1 = 2$

Arithmetic and Geometric Sequences, Series … Set 3

Answers

Sequences/Series Test Practice

21) $\frac{1094}{729}$ 22) -39062

23) 1093 24) 29524 25) -11.375 26) 4.8125

27) $-\frac{9}{10}$ 28) No sum 29) 3 30) 4

31) 6, 106, 206, 306, 406 32) $-21, -18, -15, -12, -9$ 33) 11, 18, 25, 32

34) 35, 39, 43, 47 35) 1, 2, 6, 24 36) $-\frac{12}{7}, -\frac{3}{14}, \frac{9}{7}, \frac{39}{14}$

37) $1, -4, 16, -64, 256$ 38) $2, -10, 50, -250, 1250$

Arithmetic and Geometric Sequences, Series … Set 3

Sequences/Series Test Practice

If the sequence is arithmetic or geometric, find the next 3 terms.

1) 3, −6, 12, −24, 48, ...

2) −0.5, 1, −2, 4, −8, ...

3) 0, 2, 6, 14, 30, ...

4) −1, −2, −6, −24, −120, ...

Given the first term and the common difference of an arithmetic sequence find the term named in the problem.

5) $a_1 = 33,\ d = 30$
Find a_{39}

6) $a_1 = 18,\ d = -4$
Find a_{32}

Find the missing term or terms in each arithmetic sequence.

7) ..., −40, ___, ___, ___, ___, −1040, ...

8) ..., −30, ___, ___, ___, ___, −75, ...

Given the first term and the common ratio of a geometric sequence find the term named in the problem.

9) $a_1 = -3,\ r = -4$
Find a_{10}

10) $a_1 = -1,\ r = 2$
Find a_9

Find the missing term or terms in each geometric sequence.

11) ..., 3, ___, ___, ___, ___, 9375, ...

12) ..., −1, ___, ___, ___, −16, ...

Evaluate each arithmetic series described.

13) $\sum_{k=2}^{21} (5k - 10)$

14) $\sum_{m=2}^{11} (9m - 1)$

15) $a_1 = 4,\ d = 2,\ n = 30$

16) $a_1 = 8,\ d = 3,\ n = 6$

17) $6 + 9 + 12 + 15...,\ n = 17$

18) $10 + 12 + 14 + 16...,\ n = 20$

Arithmetic and Geometric Sequences, Series … Set 3

Answers

Sequences/Series Test Practice

1) $-96,\ 192,\ -384$ 2) $16,\ -32,\ 64$ 3) $62,\ 126,\ 254$

4) $-720,\ -5040,\ -40320$ 5) $a_{39} = 1173$ 6) $a_{32} = -106$

7) $-240,\ -440,\ -640,\ -840$ 8) $-39,\ -48,\ -57,\ -66$ 9) $a_{10} = 786432$

10) $a_9 = -256$ 11) $15,\ 75,\ 375,\ 1875$ 12) $-2,\ -4,\ -8$ 13) 950

14) 575 15) 990 16) 93 17) 510

18) 580

Arithmetic and Geometric Sequences, Series … Set 3

Determine the number of terms *n* in each arithmetic series.

19) $a_1 = -6,\ a_n = -84,\ S_n = -630$

20) $a_1 = 5,\ a_n = 61,\ S_n = 297$

Evaluate each geometric series described.

21) $-1 - 3 - 9 - 27...,\ n = 8$

22) $1 - 5 + 25 - 125...,\ n = 9$

23) $\sum_{m=1}^{7} -3 \cdot 3^{m-1}$

24) $\sum_{k=1}^{7} 3^{k-1}$

Evaluate each infinite geometric series described.

25) $\sum_{m=1}^{\infty} -\frac{6}{5} \cdot \left(-\frac{1}{2}\right)^{m-1}$

26) $\sum_{n=1}^{\infty} -6 \cdot \left(\frac{3}{5}\right)^{n-1}$

27) $-2 - 1 - \frac{1}{2} - \frac{1}{4}...$

28) $-4.5 + 0.9 - 0.18 + 0.036...$

Determine the number of terms *n* in each geometric series.

29) $a_1 = -1,\ r = -6,\ S_n = -1111$

30) $a_1 = 1,\ r = 5,\ S_n = 31$

Given the recursive formula for an arithmetic sequence find the first five terms.

31) $a_{n+1} = a_n + 10$
$a_1 = -8$

32) $a_{n+1} = a_n - 200$
$a_1 = 0$

33) $a_{n+1} = a_n \cdot -4$
$a_1 = -1$

34) $a_{n+1} = a_n \cdot 6$
$a_1 = 4$

35) $a_{n+1} = a_n \cdot 5$
$a_1 = -3$

36) $a_{n+1} = a_n + n$
$a_1 = 5$

37) $a_{n+1} = a_n \cdot -2$
$a_1 = 3$

38) $a_{n+1} = a_n \cdot 3$
$a_1 = 2$

Answers

Sequences/Series Test Practice

19) 14

20) 9

21) −3280

22) 325521

23) −3279

24) 1093

25) $-\frac{4}{5}$

26) −15

27) −4

28) −3.75

29) 5

30) 3

31) −8, 2, 12, 22, 32

32) 0, −200, −400, −600, −800

33) −1, 4, −16, 64

34) 4, 24, 144, 864

35) −3, −15, −75, −375

36) 5, 7, 10, 14

37) 3, −6, 12, −24, 48

38) 2, 6, 18, 54, 162