***Solution Section* 5.6 – Arithmetic and Geometric Sequences**

***Exercise***

Show that the sequence  is arithmetic, and find the common difference.

***Solution***

We to show that  equals to a constant.







***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***













***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***













***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***













***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***

















***Exercise***

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***Solution***







***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***







***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***







***Exercise***

Find the *n*th term, and the tenth term of the arithmetic sequence: 

***Solution***







***Exercise***

Find the common difference for the arithmetic sequence with the specified terms: 

***Solution***







***Exercise***

Find the specified term of the arithmetic sequence that has two given terms: 

***Solution***













***Exercise***

Find the specified term of the arithmetic sequence that has two given terms: 

***Solution***











***Exercise***

Find the specified term of the arithmetic sequence that has two given terms: 

***Solution***



























***Exercise***

Find the specified term of the arithmetic sequence that has two given terms: 

***Solution***













***Exercise***

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***Exercise***

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***Solution***











***Exercise***

Find the specified term of the arithmetic sequence that has two given terms: 

***Solution***











***Exercise***

Find the sum  of the arithmetic sequence that satisfies the conditions: 

***Solution***



***Exercise***

Find the sum  of the arithmetic sequence that satisfies the conditions: 

***Solution***











***Exercise***

Find the number of integers between 32 and 390 that are divisible by 6, find their sum

***Solution***

Number of terms: 



***Exercise***

Find the number of terms in the arithmetic sequence with the given conditions: 

***Solution***















***Exercise***

Express the sum in terms of summation notation and find the sum .

***Solution***

Difference in terms:

*d* = 11 − 2 = 9

Number of terms:







Hence the *n*th term is: 



***Exercise***

Express the sum in terms of summation notation and find the sum .

***Solution***

Difference in terms:

*d* = 64 − 60 = 4

Number of terms:





Hence the *n*th term is: 



***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms:

*d* = 3 − 1 = 2

Number of terms:











***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: *d* = 4 − 2 = 2

Number of terms:









***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms:

*d* = 5 − 2 = 3

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms:

*d* = 12 − 7 = 5

Number of terms:









***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms:

*d* = 78 − 73 = 5

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms:

*d* = 1 − 7 = −6

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***



***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: 

Number of terms:  



***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: 

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: 

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: 

Number of terms:





***Exercise***

Find each arithmetic sum 

***Solution***

Difference in terms: 

Number of terms:





***Exercise***

Show that the given sequence is geometric, and find the common ratio



***Solution***

To be geometric, we must show that  is equal to some constant, which is the common ratio.

The common ratio:





***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 





















***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence



***Solution***

***Given***: 

















***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 













***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 















***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 









***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence



***Solution***

***Given***: 



















***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 









***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 









***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 









***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 











***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***

***Given***: 











***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***







***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***











***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***











***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***











***Exercise***

Find the ***n***th term, the *fifth* term, and the *eighth* term of the geometric sequence 

***Solution***











***Exercise***

Find all possible values of ***r*** for a geometric sequence with the two given terms 

***Solution***









***Exercise***

Find the *sixth* term of the geometric sequence whose first two terms are 4 and 6

***Solution***

***Given***: 













***Exercise***

Given a geometric sequence with , find *r* and 

***Solution***









***Exercise***

Find the specified term of the geometric sequence 

***Solution***





***Exercise***

Find the specified term of the geometric sequence 

***Solution***















***Exercise***

Find the specified term of the geometric sequence 

***Solution***













***Exercise***

Find the specified term of the geometric sequence 

***Solution***



***Exercise***

Find the specified term of the geometric sequence 

***Solution***













***Exercise***

Find the specified term of the geometric sequence 

***Solution***







***Exercise***

Find the specified term of the geometric sequence 

***Solution***













***Exercise***

Express the sum in terms of summation notation: . (Answers are not unique)

***Solution***

*n* = 5

*d* = 11 − 4 = 7







***Exercise***

Express the sum in terms of summation notation: . (Answers are not unique)

***Solution***

Difference in terms: *d* = 11 − 4 = 7

Number of terms: 







***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*) 

***Solution***







***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*): 

***Solution***

Number of terms: *n* = 4



***Numerator:***





***Denominator:***







Hence the *n*th term is: 

***Exercise***

Express the sum in terms of summation notation (Answers are not unique.) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (Answers are not unique.) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*): 

***Solution***



***Numerator:***



***Denominator*:**







***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*.) 

***Solution***





***Exercise***

Express the sum in terms of summation notation (*Answers are not unique*.) 

***Solution***





***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***









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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***





**** ⇒ The sum ***doesn’t exist***.

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***





***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



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***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***

**** The series ***converges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



**** The series ***converges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



**** The series ***converges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



**** The series ***converges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



 The series ***diverges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***



 The series ***diverges***

***Exercise***

Find the sum of the infinite geometric series if it exists: 

***Solution***





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**** The series ***converges***

***Exercise***

Find the sum: 

***Solution***







***Exercise***

Find the sum: 

***Solution***







***Exercise***

Find the sum: 

***Solution***









***Exercise***

Find the sum: 

***Solution***









***Exercise***

Find the sum: 

***Solution***









***Exercise***

Find the sum: 

***Solution***









***Exercise***

Find the sum: 

***Solution***





***Exercise***

Find the sum: 

***Solution***











***Exercise***

Find the sum: 

***Solution***









***Exercise***

Find the sum : 

***Solution***





, the series ***converges***

***Exercise***

Find the sum: 

***Solution***







 The series ***converges***

***Exercise***

Find the sum: 

***Solution***

Since , the series ***diverges***

***Exercise***

Find the sum: 

***Solution***





 The series ***converges***

***Exercise***

Find the sum: 

***Solution***





 The series ***converges***

***Exercise***

Find the sum: 

***Solution***

Since , the series ***diverges***

***Exercise***

Find the sum: 

***Solution***





 The series ***converges***

***Exercise***

Find the sum: 

***Solution***





 The series ***converges***

***Exercise***

Find the sum: 

***Solution***

















***Exercise***

Find the sum of the first 120 terms of: 

***Solution***











***Exercise***

Find the sum of the first 46 terms of 

***Solution***











***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find the rational number represented by the repeating decimal 

***Solution***







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***Exercise***

Find *x* so that , , and  are consecutive terms of an arithmetic sequence.

***Solution***















***Exercise***

Find *x* so that , , and  are consecutive terms of an arithmetic sequence.

***Solution***













***Exercise***

Find *x* so that , , and  are consecutive terms of a geometric sequence.

***Solution***















***Exercise***

Find *x* so that ,  and  are consecutive terms of a geometric sequence.

***Solution***









***Exercise***

How many terms must be added in an arithmetic sequence whose first term is 11 and whose common difference is 3 to obtain a sum of 1092?

***Solution***

***Given***: 











***Exercise***

How many terms must be added in an arithmetic sequence whose first term is 78 and whose common difference is −4 to obtain a sum of 702?

***Solution***

***Given***: 











***Exercise***

The first ten rows of seating in a certain section of a stadium have 30 seats, 32 seats, 34 seats, and so on. The eleventh through the twentieth rows each contain 50 seats. Find the total number of seats in the section.

***Solution***

***Given***: 

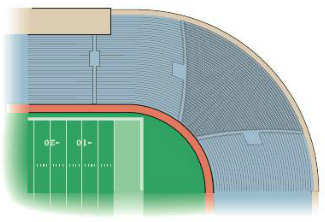






***Exercise***

The corner section of a football stadium has 15 seats in the first row and 40 rows in all. Each successive row contains two additional seats. How many seats are in this section?



***Solution***

***Given***: 



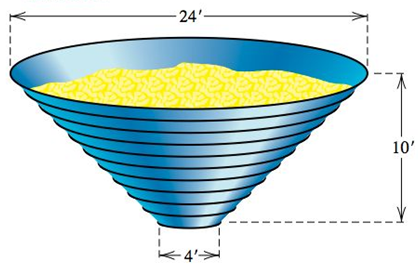




The corner section has 2,160 seats.

***Exercise***

A gain bin is to be constructed in the shape of a frustum of a cone.



The bin is to be 10 *feet* tall with 11 metal rings positioned uniformly around it, from the 4-foot opening at the bottom to the 24-foot opening at the top. Find the total length of metal needed to make the rings.

***Solution***

The circumference of each ring is .









***Exercise***

A bicycle rider coasts downhill, traveling 4 *feet* the first second. In each succeeding second, the rider travels 5 *feet* farther than in the preceding second. If the rider reaches the bottom of the hill in 11 *seconds*, find the total distance traveled.

***Solution***

***Given: ***



**∴** the total distance traveled 319 *feet*.

***Exercise***

A contest will have five each prizes totaling $5,000, and there will be a $100 difference between successive prices. Find the first prize.

***Solution***

***Given***: 





***Exercise***

A Company is to distribute $46,000 in bonuses to its top ten salespeople. The tenth salesperson on the list will receive $1,000, and the difference in bonus money between successively ranked salesperson is to be constant. Find the bonus for each salesperson.

***Solution***

***Given***: 







***Exercise***

Assuming air resistance is negligible, a small object that is dropped from a hot air balloon falls 16 *feet* during the first second, 48 *feet* during the second second, 80 *feet* during the third second, 112 *feet* during the fourth second, and so on. Find an expression for the distance the object falls in *n* seconds.

***Solution***

***Given*** the sequence: 16, 48, 80, 112, ⋯

This is an arithmetic sequence with:







***Exercise***

A brick staircase has a total of 30 steps. The bottom step requires 100 bricks. Each successive step requires two fewer bricks than the prior step.

1. How many bricks are required for the top step?
2. How many bricks are required to build the staircase?

***Solution***

1. ***Given***: 







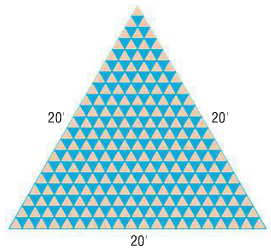
1.  



It required 2130 *bricks* to build the staircase.

***Exercise***

A mosaic is designed in the shape of an equilateral triangle, 20 *feet* on each side. Each tile in the mosaic is in the shape of an equilateral triangle, 12 *inches* to a side. The tiles are to alternate in color as shown below.



How many tiles of each color will be required?

***Solution***

Bottom row has 20 lighter colored tiles.

Top row has 1 lighter colored tile.

The number decreases by 1 as we move up the triangle.

**∴** This is an arithmetic sequence with: 







**∴** There are 210 *lighter colored* tiles.

Bottom row has 19 darker colored tiles.

Top row has 1 darker colored tile.

**∴** This is an arithmetic sequence with: 





**∴** There are 190 *darker colored* tiles.