***Solution Section* 5.5 – Infinite Sequences and Summation Notation**

***Exercise***

Find the first four terms and the eight term of the sequence: 

***Solution***













***Exercise***

Find the first four terms and the eight term of the sequence: 

***Solution***





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***Exercise***

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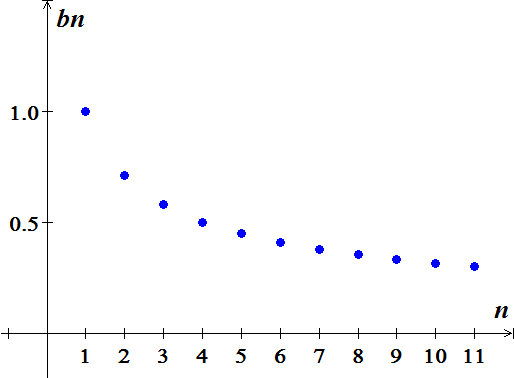












***Exercise***

Graph the sequence 

***Solution***





***Exercise***

Find the first four terms of the sequence of partial sums for the given sequence. 

***Solution***

























***Exercise***

Find the first five terms of the recursively defined infinite sequence: 

***Solution***

























***Exercise***

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***Exercise***

Find the first 5 terms of the recursively defined infinite sequence:

***Solution***

























***Exercise***

Express each sum using summation notation 

***Solution***



***Exercise***

Express each sum using summation notation 

***Solution***



***Exercise***

Express each sum using summation notation 

***Solution***



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Express each sum using summation notation 

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***Solution***



***Exercise***

Express each sum using summation notation 

***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***

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***Solution***



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***Solution***





***Exercise***

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***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***

Write out each sum 

***Solution***



***Exercise***

Write out each sum 

***Solution***





***Exercise***

Write out each sum 

***Solution***





***Exercise***

Write out each sum 

***Solution***





***Exercise***

Write out each sum 

***Solution***



***Exercise***

Fred has a balance of $3,000 on his card which charges 1% interest per month on any unpaid balance. Fred can afford to pay $100 toward the balance each *month*. His balance each month after making a $100 payment is given by the recursively defined sequence



Determine Fred’s balance after making the first payment. That is, determine 

***Solution***







Fred’s balance is $2,930 after making the first payment.

***Exercise***

A pond currently has 2,000 trout in it. A fish hatchery decides to add an additional 20 trout each month. Is it also known that the trout population is grwoing at a rate of 3% per *month*. The size of the population after *n* months is given bu the recursively defined sequence



How many trout are in the pond after 2 months? That is, what is ?

***Solution***













There are approximately 2162 ***trout*** in the pond after 2 *months*.

***Exercise***

Fred bought a car by taking out a loan for $18,500 at 0.5% interest per month. Fred’s normal monthly payment is $434.47 per month, but he decides that he can afford to pay $100 extra toward the balance each month. His balance each month is given by the recursively defined sequence



Determine Fred’s balance after making the first payment. That is, determine 

***Solution***







Fred’s balance is $18.058.03 after making the first payment.

***Exercise***

The Environmental Protection Agency (EPA) determines that Maple Lake has 250 *tons* of pollutant as a result of industrial waste and that 10% of the pollutant present is neuttralized by solar oxidation every year. The EPA imposes new pollution control laws that result in 15 *tons* of new pollutant entering the lake each year. The amount of pollutant in the lake after *n* years is given by the recursively defined sequence



Determine the amount of pollutant in the lake after 2 years? That is, what is ?

***Solution***













There are 231 ***tons*** of pollutants after 2 *years*.

***Exercise***

A colony of rabbits begins with one pair of mature rabbits, which will produce a pair of offspring (one male, one female) each month. Assume that all rabbits mature in 1 month and produce a pair of offspring (one male, one female) after 2 months. If no rabbits ever die, how many pairs of mature rabbits are there after 7 months?

|  |  |
| --- | --- |
| 1 mature pair |  |
| 1 mature pair |
| 2 mature pairs |
| 3 mature pairs |

***Solution***





















After 7 *months* there are 21 *mature* pairs of rabbits.

***Exercise***

Let 

Define the *n*th term of a sequence

1. Show that  and 
2. Show that 
3. Draw the conclusion that  is a Fibonacci sequence
4. Find the first ten terms of the sequence from part (*c*)

***Solution***

1. 











1. 

















 ***√***

1. Since  and  and 

**∴**  is a Fibonacci sequence

1. 

















