GreatHearts

Pre-Calculus: Week of May 4 – May 8

Time Allotment: 40 minutes per day

Student Name: ________________________________

Teacher Name: Mrs. Melisa R. Walters

Packet Overview

Date	Objective(s)	Page Number
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Zoom Guided Instruction:

Period 3 Monday and Wednesday from 1:00PM – 1:50 PM

Period 4 Tuesday and Thursday from 10:00AM – 10:50 AM

Period 6 Tuesday and Thursday from 1:00PM – 1:50 PM

Thank you for your hard work students. I appreciate all of you. Have a great day!

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

____

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

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Monday, May 4

Pre-Calculus: Chapter 11
Lesson 1: Using Factorial Notation

Objective: Justifying the terms of a sequence using factorial notation.

Lesson 1
The formulas for some sequences include products of consecutive positive integers. **n factorial**, written as n! is the product of the positive integers from 1 to n. For example,

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$$
$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

An example of formula containing a factorial is $a_n = (n+1)!$. The sixth term of the sequence can be found substituting 6 for n.

$$a_6 = (6+1)! = 7! = 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 5{,}040$$

The factorial of any whole number n is n(n-1)! We can therefore also think of 5! As 5·4!

n factorial
***n* factorial** is a mathematical operation that can be defined using a recursive formula. The factorial of n, denoted $n!$, is defined for a positive integer n as:

$$0! = 1$$
$$1! = 1$$
$$n! = n(n-1)(n-2)\cdots(2)(1), \text{ for } n \geq 2$$

The special case 0! is defined as 0! = 1.

Question: Can factorials always be found using a calculator?
Answer: No. Factorials get large very quickly—faster than even exponential functions! When the output gets too large for the calculator, it will not be able to calculate the factorial.

Example: Writing the Terms of a Sequence Using Factorials
Write the first five terms of the sequence defined by the explicit formula $a_n = \frac{5n}{(n+2)!}$.

Solution: Substitute n = 1, n=2, and so on in the formula.

$$n = 1 \qquad a_1 = \frac{5(1)}{(1+2)!} = \frac{5}{3!} = \frac{5}{3\cdot2\cdot1} = \frac{5}{6}$$

$$n = 2 \qquad a_2 = \frac{5(2)}{(2+2)!} = \frac{10}{4!} = \frac{10}{4\cdot3\cdot2\cdot1} = \frac{5}{12}$$

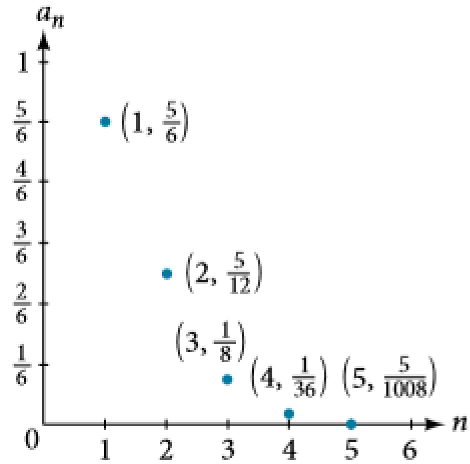
$$n = 3 \qquad a_3 = \frac{5(3)}{(3+2)!} = \frac{15}{5!} = \frac{15}{5\cdot4\cdot3\cdot2\cdot1} = \frac{1}{8}$$

$$n = 4 \qquad a_4 = \frac{5(4)}{(4+2)!} = \frac{20}{6!} = \frac{20}{6\cdot5\cdot4\cdot3\cdot2\cdot1} = \frac{1}{36}$$

$$n = 5 \qquad a_5 = \frac{5(5)}{(5+2)!} = \frac{25}{7!} = \frac{25}{7\cdot6\cdot5\cdot4\cdot3\cdot2\cdot1} = \frac{5}{1{,}008}$$

The first five terms are $\left\{\frac{5}{6}, \frac{5}{12}, \frac{1}{8}, \frac{1}{36}, \frac{5}{1008}\right\}$.

Analysis Below shows the graph of the sequence. Notice that, since factorials grow very quickly, the presence of the factorial term in the denominator results in the denominator becoming much larger than the numerator as n increases. This means the quotient gets smaller and, as the plot of the terms shows, the terms are decreasing and nearing zero.



Your turn to try it!
Writhe the first five terms defined by the explicit formula $a_n = \frac{(n+1)!}{2n}$.

<u>Technology:</u> If you'd like to use your calculator to calculate these sequences, then here are the steps to help you. It is not mandatory.

Follow these steps to evaluate a sequence defined recursively using a graphing calculator:

- On the home screen, key in the value for the initial term a_1 and press [ENTER]
- Enter the recursive formula by keying in all numerical values given in the formula, along with the key strokes [2ND] ANS for the previous term a_{n-1}. Press [ENTER].
- Continue pressing [ENTER] to calculate the values for each successive term.

Any questions right now? Please email me at Melisa.Walters@greatheartsnorthernoaks.org

<u>Exercises for Monday, May 4, 2020</u>

Section Exercises page 949 #39 – 45 odds.

Tuesday, May 5

Pre-Calculus: Chapter 11
Lesson 2: Arithmetic Sequences

Objective: Calculating the common difference

Lesson 2

Companies often make large purchases, such as computers and vehicles, for business use. The book-value of these supplies decreases each year for tax purposes. This decrease in value is called depreciation.
One method of calculating depreciation is straight-line depreciation, in which the value of the asset decreases by the same amount each year. As an example, consider a woman who starts a small contracting business. She purchases a new truck for $25,000. After five years, she estimates that she will be able to sell the truck for $8,000. The loss in value of the truck will therefore be $17,000, which is $3,400 per year for five years. The truck will be worth $21,600 after the first year; $18,200 after two years; $14,800 after three years; $11,400 after four years; and $8,000 at the end of five years. This week, we will consider specific kinds of sequences that will allow us to calculate depreciation, such as the truck's value

Finding Common Differences

The values of the truck in the example are said to form an arithmetic sequence because they change by a constant amount each year. Each term increases or decreases by the same constant value called the common difference of the sequence. For this sequence, the common difference is −3,400.

$$\{25000, \xrightarrow{-3,400} 21600, \xrightarrow{-3,400} 18200, \xrightarrow{-3,400} 14800, \xrightarrow{-3,400} 11400, \xrightarrow{-3,400} 8000\}$$

The sequence below is another example of an arithmetic sequence. In this case, the constant difference is 3. You can choose any term of the sequence, and add 3 to find the subsequent term.

$$\{3, \xrightarrow{+3} 6, \xrightarrow{+3} 9, \xrightarrow{+3} 12, \xrightarrow{+3} 15, \ldots\}$$

arithmetic sequence

An **arithmetic sequence** is a sequence that has the property that the difference between any two consecutive terms is a constant. This constant is called the **common difference**. If a_1 is the first term of an arithmetic sequence and d is the common difference, the sequence will be:

$$\{a_n\} = \{a_1, a_1 + d, a_1 + 2d, a_1 + 3d, \ldots\}$$

Example: Finding Common Differences

Is each sequence arithmetic? If so, find the common difference.

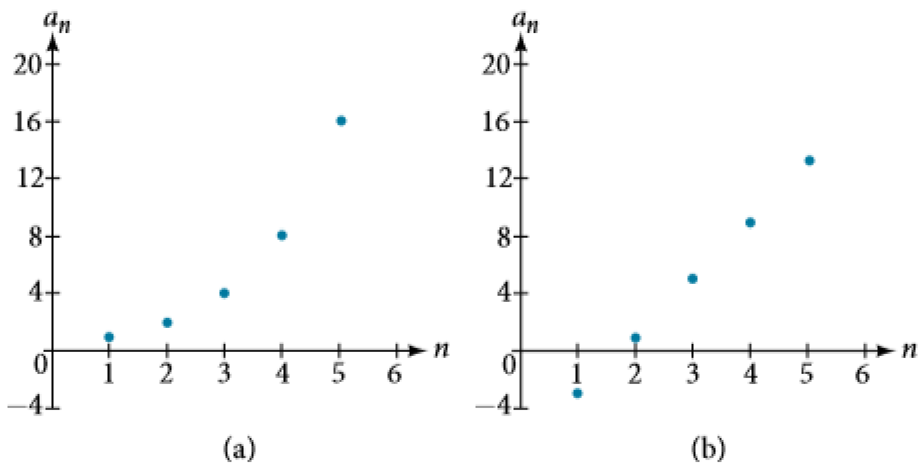
a. {1,2,4,8, 16,…}

b. {-3,1,5,9, 13,…}

Solution: Subtract each term from the subsequent term to determine whether a common difference exists.

a. $The\ sequence\ is\ NOT\ arithmetic: 2 - 1 = 1 \quad 4 - 2 = 2 \quad 8 - 4 = 4 \quad 16 - 8 = 8$
b. $The\ sequence\ is\ arithmetic\ because\ there\ is\ a\ common\ difference.\ The\ common\ difference\ is\ 4.$
   1− (-3) = 4   5 – 1 = 4   9 – 5 = 4   13 – 9 = 4

Analysis The graph of each of these sequences is shown below. We can see from the graphs that, although both sequences show growth, a is not linear whereas b is linear. **NOTE**: Arithmetic sequences have a constant rate of change so their graphs will always be points on a line.



Question: If we are told that a sequence is arithmetic, do we have to subtract every term from the following term to find the common difference?
Answer: No. If we know that the sequence is arithmetic, we can choose any one term in the sequence, and subtract it from the subsequent term to find the common difference.

YOUR turn to try it!

Is the given sequence arithmetic? If so, find the common difference.   {18, 16, 14, 12, 10, …}

****Please check answer key before proceeding.*

<u>Writing Terms of Arithmetic Sequences</u>
Now that we can recognize an arithmetic sequence, we will find the terms if we are given the first term and the common difference. The terms can be found by beginning with the first term and adding the common difference repeatedly. In addition, any term can also be found by plugging in the values of n and d into formula below.

$$a_n = a_1 + (n - 1)d$$

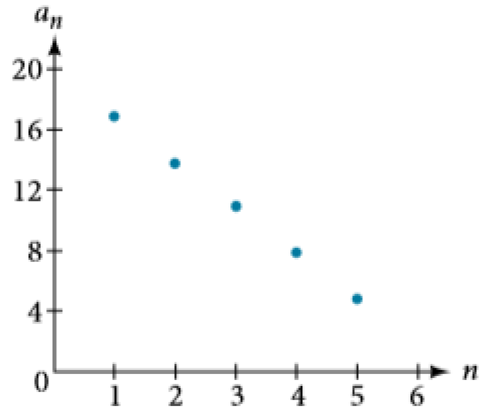
<u>STEPS on how to:</u>
Given the first term and the common difference of an arithmetic sequence, find the first several terms.

1. Add the common difference to the first term to find the second term.
2. Add the common difference to the second term to find the third term.
3. Continue until all of the desired terms are identified.
4. Write the terms separated by commas within brackets.

Example: Writing terms of Arithmetic Sequences
Write the first five terms of the arithmetic sequence with $a_1 = 17$ and $d = -3$.

Solution: Adding -3 is the same as subtracting 3. Beginning with the first term, subtract 3 from each term to find the next term. The first terms are {17, 14, 11, 8, 5}

Analysis As expected, the graph of the sequence consists of points on a line as shown below.



<u>STEPS on how to find a given term:</u>
Given any first term and any other term in an arithmetic sequence, find a given term.

1. Substitute the values given for a_1, a_n, n into the formula $a_n = a_1 + (n - 1)d$ to solve for d.
2. Find a given term by substituting the appropriate values for a_1, n, and d into the formula $a_n = a_1 + (n - 1)d$.

Example: Writing terms of Arithmetic Sequences
Given $a_1 = 8$ and $a_4 = 14$, find a_5

Solution: The sequence can be written in terms of the initial term 8 and the common difference d.

$$\{8, 8+d, 8+2d, 8+3d\}$$

We know the fourth term equals 14; we know the fourth term has the form $a_1 + 3d = 8+3d$.
We can find the common difference d.

$a_n = a_1 + (n-1)d$	
$a_4 = a_1 + 3d$	
$a_4 = 8 + 3d$	Write the fourth term of the sequence in terms of a_1 and d.
$14 = 8 + 3d$	Substitute 14 for a_4.
$d = 2$	Solve for the common difference.

Find the fifth term by adding the common difference to the fourth term. $a_5 = a_4 + 2 = 16$

Analysis Notice that the common difference is added to the first term once to find the second term, twice to find the third term, three times to find the fourth term, and so on. The tenth term could be found by adding the common difference to the first term nine times or by using the equation $a_n = a_1 + (n - 1)d$.

Any questions right now? Please email me at melisa.walters@greatheartsnorthernoaks.org

<u>Exercises for Tuesday, May 5, 2020</u>

Section Exercises page 958 #1,3,5,9,

<u>Wednesday, May 6</u>

Pre-Calculus: Chapter 11
Lesson 3: Arithmetic Sequences

Objective: Calculating Arithmetic Sequences by using Recursive Formulas

Lesson 3

Some arithmetic sequences are defined in terms of the previous term using a recursive formula. The formula provides an algebraic rule for determining the terms of the sequence. A recursive formula allows us to find any term of an arithmetic sequence using a function of the preceding term. Each term is the sum of the previous term and the common difference. For example, if the common difference is 5, then each term is the previous term plus 5. As with any recursive formula, the first term must be given.

$$a_n = a_{n-1} + d \qquad n \geq 2$$

recursive formula for an arithmetic sequence

The recursive formula for an arithmetic sequence with common difference d is:

$$a_n = a_{n-1} + d \quad n \geq 2$$

<u>STEPS on how to:</u>

Given an arithmetic sequence, write its recursive formula.

1. Subtract any term from the subsequent term to find the common difference.
2. State the initial term and substitute the common difference into the recursive formula for arithmetic sequences

Example: Writing a Recursive Formula for an Arithmetic Sequence

Write a recursive formula for the arithmetic sequence. $\{-18, -7, 4, 15, 26, \ldots\}$

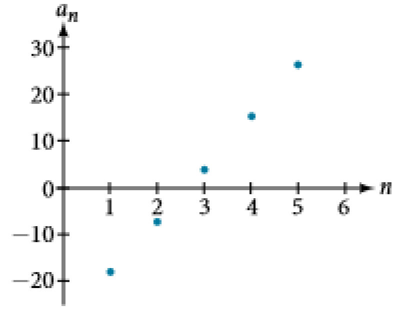
Solution: The first term is given as −18. The common difference can be found by subtracting the first term from the second term

$$d = -7 - (-18) = 11$$

Substitute the initial term and the common difference into the recursive formula for arithmetic sequences.

$$a_1 = -18$$
$$a_n = a_{n-1} + 11, \text{ for } n \geq 2$$

Analysis We see that the common difference is the slope of the line formed when we graph the terms of the sequence, as shown below. The growth pattern of the sequence shows the constant difference of 11 units.



Question: Do we have to subtract the first term from the second term to find the common difference?
Answer: No. We can subtract any term in the sequence from the subsequent term. It is, however, most common to subtract the first term from the second term because it is often the easiest method of finding the common difference.

YOUR Turn to Try it!

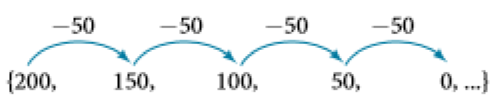
Write a recursive formula for the arithmetic sequence. {25, 37, 49, 61, …}

****Please check the answer key before proceeding.*

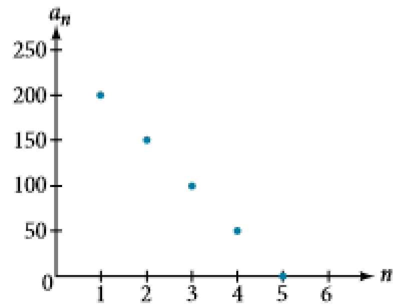
<u>Using explicit Formulas for Arithmetic Sequences</u>
We can think of an arithmetic sequence as a function on the domain of the natural numbers; it is a linear function because it has a constant rate of change. The common difference is the constant rate of change, or the slope of the function. We can construct the linear function if we know the slope and the vertical intercept.

$$a_n = a_1 + d(n - 1)$$

To find the y-intercept of the function, we can subtract the common difference from the first term of the sequence. Consider the following sequence.



The common difference is −50, so the sequence represents a linear function with a slope of −50. To find the y-intercept, we subtract −50 from 200: 200 − (−50) = 200 + 50 = 250. You can also find the y -intercept by graphing the function and determining where a line that connects the points would intersect the vertical axis. The graph is shown below.



Recall the slope-intercept form of a line is y = mx + b. When dealing with sequences, we use an in place of y and n in place of x. If we know the slope and vertical intercept of the function, we can substitute them for m and b in the slope-intercept form of a line. Substituting − 50 for the slope and 250 for the vertical intercept, we get the following equation:

$$a_n = -50n + 250$$

We do not need to find the vertical intercept to write an explicit formula for an arithmetic sequence. Another explicit formula for this sequence is $a_n = 200 - 50(n - 1)$, which simplifies to $a_n = -50n + 250$.

explicit formula for an arithmetic sequence

An explicit formula for the *n*th term of an arithmetic sequence is given by

$$a_n = a_1 + d(n - 1)$$

STEPS on how to:

Given the first several terms for an arithmetic sequence, write an explicit formula.

1. Find the common difference, $a_2 - a_1$.
2. Substitute the common difference and the first term into $a_n = a_1 + d(n - 1)$.

Example: Writing the nth Term Explicit Formula for an Arithmetic Sequence
Write an explicit formula for the arithmetic sequence. {2, 12, 22, 32, 42, …}

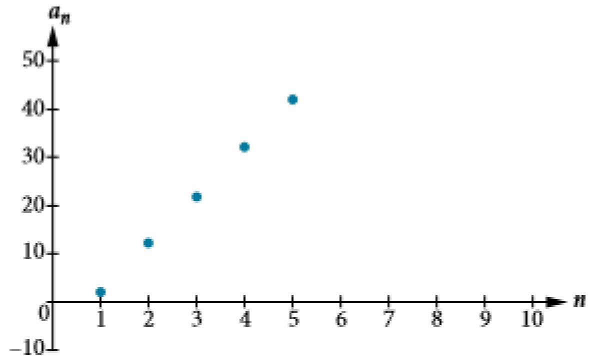
Solution: The common difference can be found by subtracting the first term from the second term.

$$\begin{aligned} d &= a_2 - a_1 \\ &= 12-2 \\ &= 10 \end{aligned}$$

The common difference is 10. Substitute the common difference and the first term of the sequence into the formula and simplify.

$$a_n = 2 + 10(n - 1)$$
$$a_n = 10n - 8$$

Analysis The graph of this sequence, represented in Figure 5, shows a slope of 10 and a vertical intercept of −8.



Your Turn to try it!
Write an explicit formula for the following arithmetic sequence. {50, 47, 44, 41, … }

**Please check answer key*

Any questions right now? Please email me at melisa.walters@greatheartsnorthernoaks.org

Exercise for Wednesday, May 6, 2020

Section Exercises page 958 #11-17 odd

Thursday, May 7

Pre-Calculus: Chapter 11
Lesson 4: Arithmetic Sequence

Objective: Applying formulas for an Arithmetic Sequence

Lesson: Finding the Number of Terms in a Finite Arithmetic Sequence
Explicit formulas can be used to determine the number of terms in a finite arithmetic sequence. We need to find the common difference, and then determine how many times the common difference must be added to the first term to obtain the final term of the sequence.

STEPS on how to:
Given the first three terms and the last term of a finite arithmetic sequence, find the total number of terms.

1. Find the common difference *d*.
2. Substitute the common difference and the first term into $a_n = a_1 + d(n - 1)$.
3. Substitute the last term for a_n and solve for n.

Example: Finding the Number of Terms in a Finite Arithmetic Sequence
Find the number of terms in the finite arithmetic sequence. $\{8, 1, -6, ... , -41\}$

Solution:
The common difference can be found by subtracting the first term from the second term.

$$1 - 8 = -7$$

The common difference is −7. Substitute the common difference and the initial term of the sequence into the nth term formula and simplify.

$$a_n = a_1 + d(n - 1)$$
$$a_n = 8 + (-7)(n - 1)$$
$$a_n = 15 - 7n$$

Substitute −41 for an and solve for n

$$-41 = 15 - 7n$$
$$8 = n$$

There are eight terms in the sequence.
Your Turn to try it!

Find the number of terms in the finite arithmetic sequence. {6, 11, 16, ... , 56

**Please check answer key*

Solving Application Problems with Arithmetic Sequences

In many application problems, it often makes sense to use an initial term of a_0 instead of a_1. In these problems, we alter the explicit formula slightly to account for the difference in initial terms. We use the following formula:

$$a_n = a_0 + d$$

Example: Solving Application Problems with Arithmetic Sequences
A five-year old child receives an allowance of $1 each week. His parents promise him an annual increase of $2 per week.

a. Write a formula for the child's weekly allowance in a given year.
b. What will the child's allowance be when he is 16 years old?

Solution:

a. The situation can be modeled by an arithmetic sequence with an initial term of 1 and a common difference of 2. Let *A* be the amount of the allowance and n be the number of years after age 5. Using the altered explicit formula for an arithmetic sequence we get:

$$A_n = 1 + 2n$$

b. We can find the number of years since age 5 by subtracting. 16 – 5 = 11

We are looking for the child's allowance after 11 years. Substitute 11 into the formula to find the child's allowance at age 16.

$$A_{11} = 1 + 2(11) = 23$$

The child's allowance at age 16 will be $23 per week.

Your Turn Try it!

A woman decides to go for a 10-minute run every day this week and plans to increase the time of her daily run by 4 minutes each week. Write a formula for the time of her run after n weeks. How long will her daily run be 8 weeks from today?

**Please check answer key*

TECHNOLOGY: Steps used to calculate on a calculator.

For the following exercises, follow the steps to work with the arithmetic sequence $a_n = 3n - 2$ using a graphing calculator:

- Press [**MODE**]
  - Select [**SEQ**] in the fourth line
  - Select [**DOT**] in the fifth line
  - Press [**ENTER**]
- Press [**Y=**]
  - nMin is the first counting number for the sequence. Set $n\text{Min} = 1$
  - $u(n)$ is the pattern for the sequence. Set $u(n) = 3n - 2$
  - $u(n\text{Min})$ is the first number in the sequence. Set $u(n\text{Min}) = 1$
- Press [**2ND**] then [**WINDOW**] to go to **TBLSET**
  - Set TblStart = 1
  - Set ΔTbl = 1
  - Set Indpnt: Auto and Depend: Auto
- Press [**2ND**] then [**GRAPH**] to go to the [**TABLE**]

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Exercises for Thursday May 7, 2020

Section Exercises page 959 #53, 55

Friday, May 8

Pre-Calculus: Chapter 11
Lesson 5: Geometric Sequences

Objective: Defining Geometric Sequences

****NOTE: First, please complete the lesson then, you may take the quiz titled "Minor Assessment" located at the end of the packet. This is the minor assessment that will need to be scanned in to google classroom. Thanks!*

Lesson:
Many jobs offer an annual cost-of-living increase to keep salaries consistent with inflation. Suppose, for example, a recent college graduate finds a position as a sales manager earning an annual salary of $26,000. He is promised a 2% cost of living increase each year. His annual salary in any given year can be found by multiplying his salary from the previous year by 102%. His salary will be $26,520 after one year; $27,050.40 after two years; $27,591.41 after three years; and so on. When a salary increases by a constant rate each year, the salary grows by a constant factor. In this section, we will review sequences that grow in this way.

Finding Common Ratios

The yearly salary values described form a geometric sequence because they change by a constant factor each year. Each term of a geometric sequence increases or decreases by a constant factor called the common ratio. The sequence below is an example of a geometric sequence because each term increases by a constant factor of 6. Multiplying any term of the sequence by the common ratio 6 generates the subsequent term.

$$\{1, \xrightarrow{\times 6} 6, \xrightarrow{\times 6} 36, \xrightarrow{\times 6} 216, \xrightarrow{\times 6} 1{,}296, \ldots\}$$

> ***definition of a geometric sequence***
> A **geometric sequence** is one in which any term divided by the previous term is a constant. This constant is called the **common ratio** of the sequence. The common ratio can be found by dividing any term in the sequence by the previous term. If a_1 is the initial term of a geometric sequence and r is the common ratio, the sequence will be
> $$\{a_1, a_1r, a_1r^2, a_1r^3, \ldots\}.$$

STEPS on how to:

Given a set of numbers, determine if they represent a geometric sequence.

1. Divide each term by the previous term.
2. Compare the quotients. If they are the same, a common ratio exists and the sequence is geometric.

Example: Finding Common Ratios

Is the sequence geometric? If so, find the common ratio.

a. 1, 2, 4, 8, 16, ...
b. 48, 12, 4, 2,...

Solution: Divide each term by the previous term to determine whether a common ratio exists.

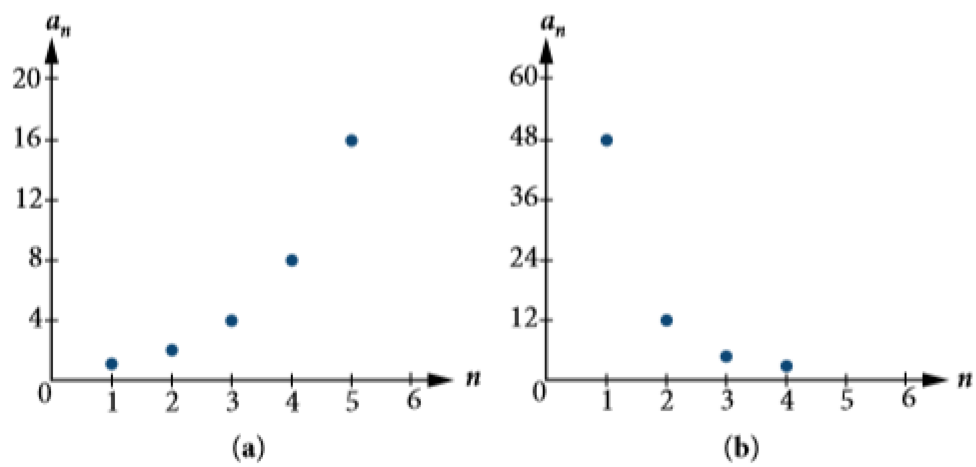
a. $\frac{2}{1} = 2 \qquad \frac{4}{2} = 2 \qquad \frac{8}{4} = 2 \qquad \frac{16}{8} = 2$

The sequence is geometric because there is a common ratio. The common ratio is 2.

b. $\frac{12}{48} = \frac{1}{4} \qquad \frac{4}{12} = \frac{1}{3} \qquad \frac{2}{4} = \frac{1}{2}$

The sequence is not geometric because there is not a common ratio.

Analysis The graph of each sequence is shown below. It seems from the graphs that both (a) and (b) appear have the form of the graph of an exponential function in this viewing window. However, we know that (a) is geometric and so this interpretation holds, but (b) is not.



Question: If you are told that a sequence is geometric, do you have to divide every term by the previous term to find the common ratio?
Answer: No. If you know that the sequence is geometric, you can choose any one term in the sequence and divide it by the previous term to find the common ratio.

Your turn to Try It!

Is the sequence geometric? If so, find the common ratio. 5, 10, 15, 20, ...

**Please check answer key*

<u>Writing Terms of Geometric Sequence</u>
Now that we can identify a geometric sequence, we will learn how to find the terms of a geometric sequence if we are given the first term and the common ratio. The terms of a geometric sequence can be found by beginning with the first term and multiplying by the common ratio repeatedly. For instance, if the first term of a geometric

sequence is $a_1 = -2$ and the common ratio is $r = 4$, we can find subsequent terms by multiplying $-2 \cdot 4$ to get -8 then multiplying the result $-8 \cdot 4$ to get -32 and so on.

$$\begin{aligned} a_1 &= -2 \\ a_2 &= (-2 \cdot 4) = -8 \\ a_3 &= (-8 \cdot 4) = -32 \\ a_4 &= (-32 \cdot 4) = -128 \end{aligned}$$

The first four terms are $\{-2, -8, -32, -128\}$.

STEPS on how to:
Given the first term and the common factor, find the first four terms of a geometric sequence.

1. Multiply the initial term, a_1, by the common ratio to find the next term, a_2.
2. Repeat the process, using $a_n = a_2$ to find a_3 and then a_3 to find a_4, until all four terms have been identified. 3. Write the terms separated by commons within brackets.

Example: Writing the Terms of a Geometric Sequence

List the first four terms of the geometric sequence with $a_1 = 5$ and $r = -2$.

Solution: Multiply a_1 by -2 to find a_2. Repeat the process, using a_2 to find a_3, and so on.

$$\begin{aligned} a_1 &= 5 \\ a_2 &= -2a_1 = -10 \\ a_3 &= -2a_2 = 20 \\ a_4 &= -2a_3 = -40 \end{aligned}$$

The first four terms are $\{5, -10, 20, -40\}$.

Your turn to Try It!
List the first five terms of the geometric sequence with $a_1 = 18$ and $r = 1/3$

**Please check answer key*

<u>Exercises for Friday, May 8, 2020</u>

Section Exercises page 967 1 – 7 odds

ANSWER KEY

Exercises for Monday, May 4, 2020

Try it! The first five terms are $\left\{1, \frac{3}{2}, 4, 15, 72\right\}$

Answers: 39. 720 41. 665,280 43. The first four terms: $1, \frac{1}{2}, \frac{2}{3}, \frac{3}{2}$ 45. First four terms: $-1, 2, \frac{6}{5}, \frac{24}{11}$

Exercises for Tuesday May 5, 2020

Try it! The sequence is arithmetic because there is a common difference. The common difference is – 2.

Answers: 1. A sequence where each successive term of the sequence increases (or decreases) by a constant value. 3. We find whether the difference between all consecutive terms is the same. This is the same as saying that the sequence has a common difference. 5. Both arithmetic sequences and linear functions have a constant rate of change. They are different because their domains are not the same; linear functions are defined for all real numbers, and arithmetic sequences are defined for natural numbers or a subset of the natural numbers.
9. The sequence is not arithmetic because 16 – 4 is NOT equal to 64 – 16.

Exercises for Wednesday May 6, 2020

Try it!
Answer: $a_1 = 25$; $a_n = a_{n-1} + 12$, for $n \geq 2$

Answer: $a_n = 53 - 3n$

Exercises:
11. 0, 2/3, 4/3, 2, 8/3
13. 0, −5, −10, −15, −20
15. $a_4 = 19$
17. $a_6 = 4$

Exercises for Thursday May 7, 2020

Try It! There are 11 terms in the sequence.

Try It! The formula is $T_n = 10 + 4n$, and it will take her 42 minutes.

Answers: 53. There are 10 terms in the sequence.
55. There are 6 terms in the sequence.

<u>Exercises for Friday, May 8, 2020</u>

Try It! The sequence is not geometric because 10/5 $\neq$ 15/10

Try It! $\left\{18, 6, 2, \frac{2}{3}, \frac{2}{9}\right\}$

Answers:

1. A sequence in which the ratio between any two consecutive terms is constant.
3. Divide each term in a sequence by the preceding term. If the resulting quotients are equal, then the sequence is geometric.
5. Both geometric sequences and exponential functions have a constant ratio. However, their domains are not the same. Exponential functions are defined for all real numbers, and geometric sequences are defined only for positive integers. Another difference is that the base of a geometric sequence (the common ratio) can be negative, but the base of an exponential function must be positive.
7. The common ratio is -2

Name:
Date:

Pre – Calculus Minor Assessment

1. Evaluate $\frac{6!}{(5-3)!3!}$.

2. Write the first four terms of the sequence defined by the explicit formula $a_n = 10^n + 3$.

3. Is the sequence $\frac{4}{7}, \frac{47}{21}, \frac{82}{21}, \frac{39}{7}$, ... arithmetic? If so, find the common difference?

4. Find the common ratio for the geometric sequence 2.5, 5, 10, 20, …