Mastery Checklist
Geometric Sequence & Series

In order to prove Mastery for this concept you must be able complete the following all by **yourself.** No help from Notes, Partners or Teacher. Use all other problems to practice and test yourself with the following:

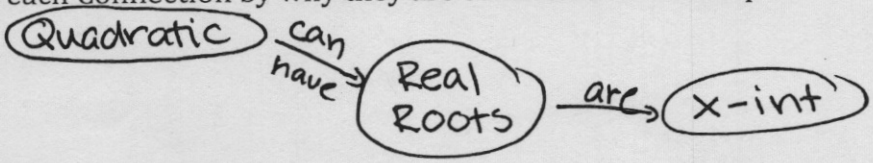
- ☐ Complete # 10 & 13 on "Geometric Sequence" worksheet
- ☐ Complete # 11, 16 & 17 on "Geometric Series" worksheet
- ☐ Complete # 16, 19 & 20 on " Cloud and Star" worksheet
- ☐ Complete a Mind Map on how the Concept of Geometric Series and Sequence is connected.

Mind Map
Geometric Series & Sequence

Task 1:
Review your notes/Quick Check/Unit 5 Test and write down all key ideas/concepts/ vocabulary/examples for LT: 5B

Task 2:
Group and Connect all your concepts together

Task 3:
Label each Connection by why they are connected. For example:



Task 4:
Add in examples and visuals where they fit.

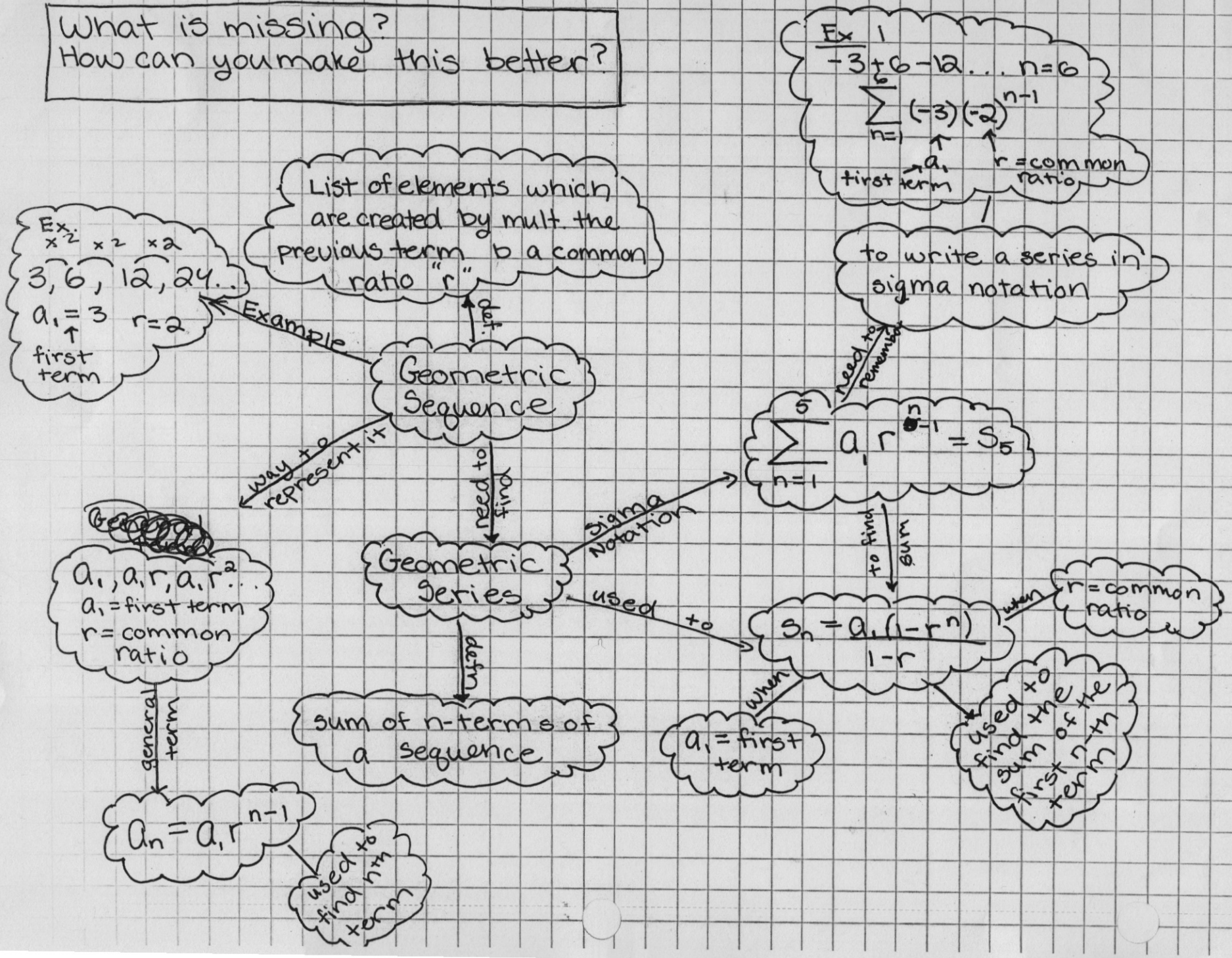
Task 5:
Review Checklist below and make sure that your Mind Map contains everything you need.

- ☐ Contains all of theses Concepts/Vocabulary

Geometric Sequence	Geometric Series	Sigma Notation
General Term	Sum	Common Ratio
Nth term	Elements	Formula
Definition		

- ☐ All Connections are labeled
- ☐ Contains Example Problems
- ☐ Contains Visuals
- ☐ Review Mind Map on the Backside and see if you need to adjust or add anything.

What is missing?
How can you make this better?



LT: 5B Geometric Sequence

Determine if the sequence is geometric. If it is, find the common ratio.

1) $-1, 6, -36, 216, \ldots$

2) $-1, 1, 4, 8, \ldots$

3) $4, 16, 36, 64, \ldots$

4) $-3, -15, -75, -375, \ldots$

5) $-2, -4, -8, -16, \ldots$

6) $1, -5, 25, -125, \ldots$

Given the explicit formula for a geometric sequence find the first five terms and the 8th term.

7) $a_n = 3^{n-1}$

8) $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

9) $a_n = -2.5 \cdot 4^{n-1}$

10) $a_n = -4 \cdot 3^{n-1}$

Given the following geometric sequence find the general term or nth term.

11.) -3, -9, -27...

12.) 6, -3, $\frac{3}{2}, -\frac{3}{4}, \ldots$

13.) 2, 6, 18, 54,...

14.) -4, 16, -64,...

Answer key

LT: 5B Geometric Sequence

Determine if the sequence is geometric. If it is, find the common ratio.

1) $-1, 6, -36, 216, \ldots$

$r = -6$

2) $-1, 1, 4, 8, \ldots$

Not Geometric

3) $4, 16, 36, 64, \ldots$

Not Geometric

4) $-3, -15, -75, -375, \ldots$

$r = 5$

5) $-2, -4, -8, -16, \ldots$

$r = 2$

6) $1, -5, 25, -125, \ldots$

$r = -5$

Given the explicit formula for a geometric sequence find the first five terms and the 8th term.

7) $a_n = 3^{n-1}$

1st 5 terms: $1, 3, 9, 27, 81$

$a_8 = 2187$

8) $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

$2, \frac{1}{2}, \frac{1}{8}, \frac{1}{32}, \frac{1}{128}$

$a_8 = \frac{1}{8192}$

9) $a_n = -2.5 \cdot 4^{n-1}$

$-2.5, -10, -40, -160, -640$

$a_8 = -40960$

10) $a_n = -4 \cdot 3^{n-1}$

$-4, -12, -36, -108, -324$

$a_8 = -8748$

Given the following geometric sequence find the general term or nth term.

11.) -3, -9, -27...

$a_n = -3(3)^{n-1}$

12.) 6, -3, $\frac{3}{2}, -\frac{3}{4}, \ldots$

$a_n = 6\left(-\frac{1}{3}\right)^{n-1}$

13.) 2, 6, 18, 54,...

$a_n = 2(3)^{n-1}$

14.) -4, 16, -64,...

$a_n = -4(-4)^{n-1} = -4^1 \cdot (-4)^{n-1} = -4^n$

since it has the same base it could be simplified

LT: 5B Geometric Series

Evaluate each geometric series described.

5) $\sum_{k=1}^{7} 4^{k-1}$

6) $\sum_{i=1}^{8} (-6)^{i-1}$

7) $\sum_{i=1}^{9} 2^{i-1}$

8) $\sum_{m=1}^{9} -2^{m-1}$

9) $\sum_{n=1}^{8} 2 \cdot (-2)^{n-1}$

10) $\sum_{n=1}^{9} 4 \cdot 3^{n-1}$

11) $\sum_{n=1}^{10} 4 \cdot (-3)^{n-1}$

12) $\sum_{n=1}^{9} (-2)^{n-1}$

13) $1 + 2 + 4 + 8..., \ n = 6$

14) $2 - 10 + 50 - 250..., \ n = 8$

15) $1 - 4 + 16 - 64..., \ n = 9$

16) $-2 - 6 - 18 - 54..., \ n = 9$

17) $1 - 5 + 25 - 125..., \ n = 7$

18) $-3 - 6 - 12 - 24..., \ n = 9$

Answer Key

LT: 5B Geometric Series

Evaluate each geometric series described.

5) $\sum_{k=1}^{7} 4^{k-1} = 5461$

6) $\sum_{i=1}^{8} (-6)^{i-1} = -239945$

7) $\sum_{i=1}^{9} 2^{i-1} = 511$

8) $\sum_{m=1}^{9} -2^{m-1} = -511$

9) $\sum_{n=1}^{8} 2 \cdot (-2)^{n-1} = 170$

10) $\sum_{n=1}^{9} 4 \cdot 3^{n-1} = 39364$

11) $\sum_{n=1}^{10} 4 \cdot (-3)^{n-1} = -59048$

12) $\sum_{n=1}^{9} (-2)^{n-1} = 171$

13) $1 + 2 + 4 + 8..., \ n = 6$

$S_6 = 63$

14) $2 - 10 + 50 - 250..., \ n = 8$

$S_8 = -130208$

15) $1 - 4 + 16 - 64..., \ n = 9$

$S_9 = 52429$

16) $-2 - 6 - 18 - 54..., \ n = 9$

$S_9 = -19682$

17) $1 - 5 + 25 - 125..., \ n = 7$

$S_7 = 13021$

18) $-3 - 6 - 12 - 24..., \ n = 9$

$S_9 = -1533$

Directions: Start with the bottom left cloud. Follow the arrows. When you get to a large star problem find the *** problem around the room. Complete your work and thinking on a dry-erase board and leave work to be checked by Ms. Mirzaian.

Try one of the following *** problems (Pink/Green) Leave your work and thinking on a big board to be checked.

Determine the **number of terms** (n) in each geometric series

17.) $a_1 = -2, r = 5, S_n = -62$

18.) $a_1 = -3, r = 4, S_n = -4095$

19.) $a_3 = 27, r = -3, S_n = -60$

20.) $a_1 = -3, r = -2, S_n = 63$

Try one of the following *** problems (Blue/Orange) Leave your work and thinking on a big board to be checked.

Evaluate the following Geometric Series:

13.) $\sum_{n=1}^{9} 4 \cdot 3^{n-1}$

14.) $\sum_{n=1}^{8} 2 \cdot (-2)^{n-1}$

15.) 1+2+4+8..., n=6

16.) 1-4+16-64.., n=9

State the first 6 terms in the sequence described below:

11.) $\sum_{i=1}^{8} (-6)^{i-1}$

12.) $\sum_{n=1}^{8} 2 \cdot (-2)^{n-1}$

Complete the **Yellow** *** Problem. Leave your work on the wall for Ms Mirzaian to check. Once you are done move on to the next one star cloud.

Start Here

Determine if the sequence is geometric. If it is, find the common ratio.

1) −1, 6, −36, 216, ...

2) −1, 1, 4, 8, ...

3) 4, 15, 36, 64, ...

4) −3, −15, −75, −375, ...

Find the general formula for the following geometric sequences:

7.) 1, 3, 9, 27, 81

8.) -2.5, 10, -40, 160

9.) 2, ½, 1/8, 1/32,

10.) -4, -12, -36, -108

Answer Key:

1.) r=-6
2.) Not geometric
3.) Not geometric
4.) R=5
5.) R=2
6.) R=-5
7.) $a_n = (1)3^{n-1}$
8.) $a_n = -2.5(-4)^{n-1}$
9.) $a_n = 2(\frac{1}{4})^{n-1}$
10.) $a_n = -4(3)^{n-1}$
11.) 1, -6, 36, -216, 1296, -7776
12.) 2, -4, 8, -16, 32,-64
13.) 39364
14.) -170
15.) 63
16.) 52429
17.) n=3
18.) n=6
19.) n=4
20.) n=6