$$\sum_{i=1}^{\infty} 3.75(0.8)^{i-1} = 3.75 + 3.75(0.8) + 3.75(0.8)^2 + 3.75(0.8)^3 + 3.75(0.8)^4 + \cdots = \frac{a}{1-r}, \text{ where } a = 3.75 \text{ and } r = 0.8.$$

So the sum is

$$\sum_{i=1}^{\infty} 3.75(0.8)^{i-1} = 3.75 + 3.75(0.8) + 3.75(0.8)^2 + 3.75(0.8)^3 + 3.75(0.8)^4 + \cdots$$

$$= \frac{3.75}{1-0.8}$$

$$= \frac{3.75}{0.2}$$

$$= 18.75$$

This matches the figure, which shows the sum of the series climbing higher and higher toward 18.75 as $n \to \infty$.

On the left is the plot of the terms $(n, 3.75(0.8)^n)$ for the geometric sequence with $a = 3.75$ and $r = 0.8$. Notice how the plot approaches 0 for large n. In other words, the terms get smaller and smaller.
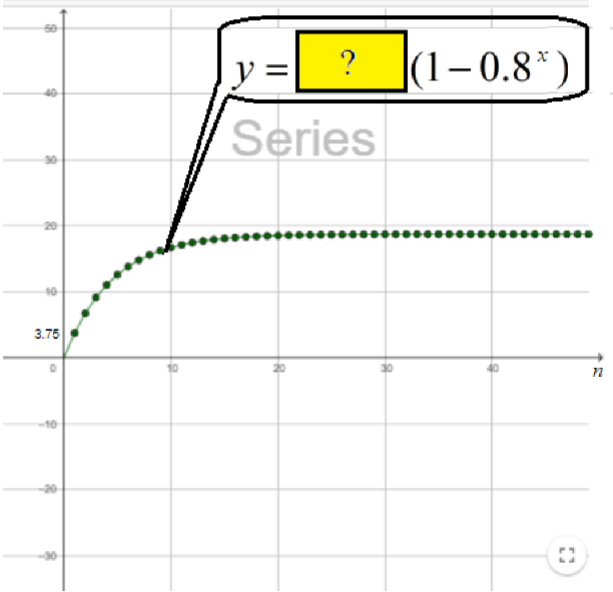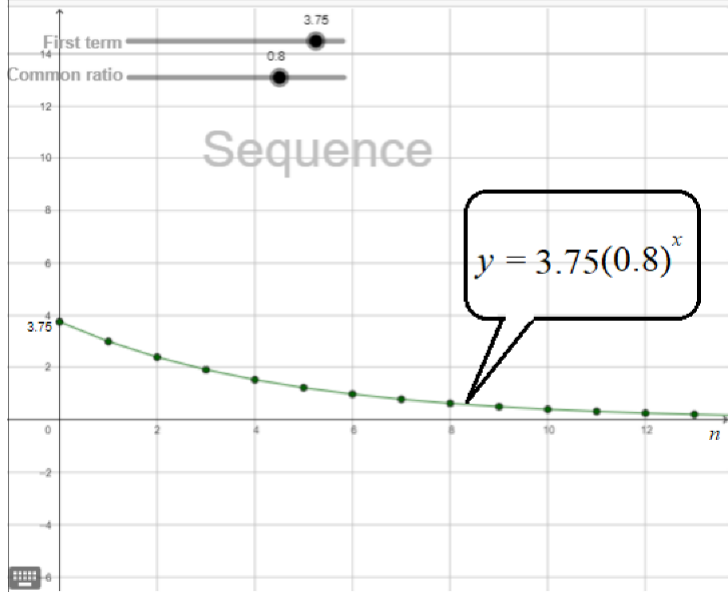
Note: $n + 1$ = Term number

On the right is the plot of the terms $\left(n, \sum_{i=0}^{n} 3.75(0.8)^{i-1}\right)$ for the geometric series with $a = 3.75$ and $r = 0.8$. Notice how the plot approaches a number close to 20 for large n.

Note: $n + 1$ = Term number

Use your formula to find what the series approaches as $n \to \infty$, i.e., what is the value of

$$\sum_{i=0}^{\infty} 3.75(0.8)^{i-1} = 3.75 + 3.75(0.8) + 3.75(0.8)^2 + 3.75(0.8)^3 + 3.75(0.8)^4 + \cdots - \boxed{?}$$

What number would be in the yellow boxes?

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	Term numbe	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3	Term value	3.75	3	2.4	1.92	1.54	1.23	0.98	0.79	0.63	0.5	0.4	0.32	0.26	0.21	0.16	0.13
4	Series	3.75	6.75	9.15	11.07	12.61	13.83	14.82	15.6	16.23	16.74	17.14	17.46	17.72	17.93	18.09	18.22
5																	

First term
Common ratio
0.8

Sequence

$$y = 3.75(0.8)^x$$

$$y = \boxed{?}\,(1 - 0.8^x)$$

Series

Congrats! You found this week's easter egg! Do the following by 11:59, April 9. Submit to John LaMaster in an email, lamaster@pfw.edu, what would be written in the first yellow box and the second yellow box and show your work to justify each answer. Take a photo of your work and attach to an email.

The Prize: For each of the yellow boxes you've answered correctly, you can have one fresh attempt on any one (1) quiz of your choice that is past due and receive full credit any time before 11:59 PM May 2.

For example, you may wish to re-do the Prerequisite Skills Quiz (which could not be dropped) or redo any quiz that may earn you the Rhino Quiz Bonus for a test. You don't need to decide on which quiz(zes) by 11:59 PM April 9, but you do need to email John with the above answers by 11:59 PM April 9.