Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_

**Math Lab  
Graphing Geometric Sequences and Series**

**Construct Understanding**

1. Choose a positive first term. Choose a common ratio, *r,* in each of the intervals in the table below. For each common ratio, create the first 5 terms of a geometric sequence.

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| --- | --- | --- |
| Interval | Common ratio, r | Geometric sequence |
| *r* > 1 |  |  |
| 0 < *r* < 1 |  |  |
| -1 < *r* < 0 |  |  |
| *r* < -1 |  |  |

1. For each sequence

* Graph the term numbers on the horizontal axis and the term values on the vertical axis. Sketch and label each graph on a grid below.
* In each case, what happens to the term values as more points are plotted?

1. Use the four geometric sequences in Part A to create four corresponding geometric series.

For each series

* Complete the table below by calculating these partial sums: S1, S2, S3, S4, S5

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| --- | --- | --- | --- | --- | --- | --- |
| Interval | Common ratio, *r* | S1 | S2 | S3 | S4 | S5 |
| *r* > 1 |  |  |  |  |  |  |
| 0 < *r* < 1 |  |  |  |  |  |  |
| -1 < *r* < 0 |  |  |  |  |  |  |
| *r* < -1 |  |  |  |  |  |  |

* Graph the numbers of terms in the partial sums on the horizontal axis and the partial sums on the vertical axis. Sketch and label each graph on a grid below.
* In each case, what happens to the partial sums as more points are plotted?

1. Without graphing

* Describe the graph of this geometric sequence: 3, 2, , , , . . . .

* Describe the graph of the partial sums of this geometric series: 3 + 2 + + + + . . .

Verify your descriptions by graphing. Sketch and label each graph on a grid below.

**Assess Your Understanding**

1. What kind of r values should be used to construct a geometric sequence with the following properties?
2. The term values approach 0 as more points are plotted.
3. The term values increase as more points are plotted.
4. The term values alternate between positive and negative as more points are plotted.
5. What kind of r values should be used to construct a geometric series with the following properties?
6. The partial sums approach a constant value as more points are plotted.
7. The partial sums increase as more points are plotted.

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