Math 4 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**1-1 Function Families Review**Date\_\_\_\_\_\_\_\_

*In this investigation, you will be working towards the following learning objectives:*

* *I can review and extend properties of basic function families and their uses in mathematical modeling*
* *I can solve problems involving basic function families*

Use the following function to answer the questions below:

1. Complete the following table of values.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | -10,000 | -1000 | -100 | -10 | 0 | 10 | 100 | 1000 | 10,000 |
| *f(x)* |  |  |  |  |  |  |  |  |  |

1. As the value of *x* decreases, what value does *f(x)* appear to approach? \_\_\_\_\_\_\_\_\_\_
2. As the value of *x* increases, what value does *f(x)* appear to approach? \_\_\_\_\_\_\_\_\_\_
3. What is the domain? (use ***interval notation***) 5. What is the range? (use ***interval notation***)

Important Vocabulary:

A function is **even** if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A function is **odd** if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. Draw an example of an even function. 7. Draw an example of an odd function.

List the type, characteristics and sketch a graph for the following functions.

**\_\_\_\_\_\_\_\_\_\_\_\_ Functions**

8.General Rule: Specific Function:



Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither, Both

Asymptotes (if any):

 What happens if the lead coefficient has the opposite sign?

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Functions**

9. General Rule: Specific Function:

 $f\left(x\right)=-4x^{2}+7x-19$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

 What happens if the lead coefficient has the opposite sign?

**\_\_\_\_\_\_\_\_\_\_\_\_Functions**

10. General Rule: Specific Function:

 $f(x)=e^{x}$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

The function above is an example of exponential growth. Give an example of a function that represents exponential decay:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Functions**

11**.** General Rule: Specific Function:

 $f(x)=ln⁡(x)$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

How does the function above relate to $g\left(x\right)=e^{x}?$

**\_\_\_\_\_\_\_\_\_\_\_\_\_ Functions**

12. General Rule: Specific Function:



Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

 How is the graph affected by the lead coefficient?

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Functions**

13. General Rule: Parent Function:

 $f(x)=\frac{6}{x^{2}}$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

 How would your graph change if *x* was raised to an odd power?

 How would your graph change if the constant term was negative?

**Sine and Cosine Functions**

14. General Rule: Specific Function:



 $f\left(x\right)=5\sin(\left(x\right))$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

15. General Rule: Specific Function:



 $f\left(x\right)=-3\cos(\left(x\right))+4$

Domain:

Range:

Symmetries (if any):

 Even, Odd, Neither

Asymptotes (if any):

 How does the *a* value affect the functions above?

 How does the *b* value affect the functions?

 How does the *c* value affect the functions?