**Properties of Function .** Name: Date:

1. Complete the table of values for  and graph it.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| x |  |
| 0 |  |
| 1 |  |
| 4 |  |
| 9 |  |
| 16 |  |

|  |  |
| --- | --- |
| x |  |
| 0 |  |
| 1 |  |
| 4 |  |
| 9 |  |
| 16 |  |

Why does the graph appear only in the first quadrant? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does the value of ever reach a maximum? Explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Domain of . \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range of *.* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete the table of values for  and graph it (in a different colour) on the same axis.

Domain of . \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range of *.* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Would the graph of  be a function? Why or why not? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Graph  on the same plane using different color (use a table of values if you have to, or recall what it looks like from Grade 10).

What is the Domain of ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How are the two graphs: and  related?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Properties of Function ** Name: Date:

1. Complete both table of values for and graph them.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| x |  |
|  ¼ |  |
| 1/3 |  |
| ½ |  |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |

|  |  |
| --- | --- |
| *x* |  |
| -¼ |  |
| -1/3 |  |
| -½ |  |
| -1 |  |
| -2 |  |
| -3 |  |
| -4 |  |

Why did the value of 0 not appear in the table of values? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Complete the following tables of values for the function to consider its long term behavior (what happens to the function as the numbers get bigger?)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | 10 | 100 | 1000 |  | *x* | -10 | -100 | -1000 |
| *f*(*x*) |  |  |  |  | *f*(*x*) |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *x* | 0.1 | 0.01 | 0.001 |  | *x* | -0.1 | -0.01 | -0.001 |
| *f*(*x*) |  |  |  |  | *f*(*x*) |  |  |  |

Describe, in your own words, what this function looks like:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Fill in the blanks.**

As the value of *x* gets larger and positive, the function approaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

As the value of *x* gets larger and negative, the function approaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

As the value of *x* gets smaller and positive, the function approaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

As the value of *x* gets smaller and negative, the function approaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

An **asymptote** is a line that a curve approaches more and more closely, but never touches. It comes from the greek word *asymptotos* which means ‘not meeting’.

What are the equations for the asymptotes of this function? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_

We also say that the graph is **discontinuous** at *x* = 0 since there is a break in the graph here.

Domain of . \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range of *.* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Summing it up!**

You will be responsible for remembering the patterns of four functions, as we will now start to look at transforming them. Make a little ‘cheat sheet’ for yourself here to have quick references for the base graphs of these functions:

|  |  |
| --- | --- |
| Domain: \_\_\_\_\_\_\_\_\_\_\_Range:\_\_\_\_\_\_\_\_\_\_\_\_ | Domain: \_\_\_\_\_\_\_\_\_\_\_Range:\_\_\_\_\_\_\_\_\_\_\_\_ |
| Domain: \_\_\_\_\_\_\_\_\_\_\_Range:\_\_\_\_\_\_\_\_\_\_\_\_ | Domain: \_\_\_\_\_\_\_\_\_\_\_Range:\_\_\_\_\_\_\_\_\_\_\_\_ |