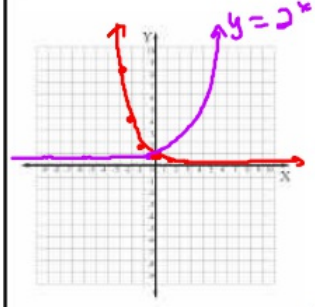
Exponential Growth

5. What is the domain and range of $y = .5^x$

D: $(-\infty, \infty)$

R: $(0, \infty)$

Use a graphing calculator to graph the function $f(x) = (0.5)^x$ along with the graph of $f(x) = 2^x$ from Part I, and sketch the graph of $f(x) = (0.5)^x$ on the grid provided below.



x	$y = 2^x$
-3	1/8
-2	1/4
-1	1/2
0	1
1	2
2	4
3	8

exp growth

x	$y = (\frac{1}{2})^x$
-3	8
-2	4
-1	2
0	1
1	1/2
2	1/4
3	1/8

exp decay

1. Is the graph an increasing or decreasing function? Explain your answer.

Decreasing (See Graph)

2. Trace or use the table feature on your calculator to fill out the tables below.

As the value of x gets very large, what happens to the value of $(0.5)^x$?

x	$(0.5)^x$
0	1
1	1/2
5	1/32
10	1/1024
20	1/1045876

$.5^x$ gets smaller

As the value of x gets very small, what happens to the value of $(0.5)^x$?

x	$(0.5)^x$
–1	2
–3	8
–5	32
–10	1024
–20	1045876

$.5^x$ get bigger

3. Will the value of $(0.5)^x$ ever equal 0? Explain your answer.

NO see graph and table

4. Are there any values of x that would make $(0.5)^x$ undefined? Explain your answer.

NO