



Exponential Reflections

Student Activity

Name _____

Class _____

Problem 1 – Reflecting the Exponential Function

Enter the equation $y = e^x$ on the $\boxed{y=}$ screen. Then press $\boxed{\text{window}}$ and change the following parameters: **Xmax=5** and **Ymax=5**. Leave all others the same. Press $\boxed{\text{graph}}$ to observe its graph.

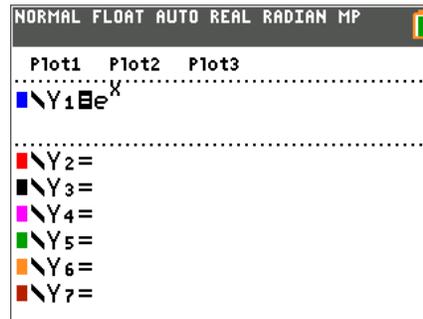
1. What would the inverse of this graph look like?

Recall that an inverse of a function is found when the input (x) is switched with the output (y).

Press $\boxed{2\text{nd}}$ $\boxed{\text{table}}$ to access a table of values for your function.

2. Record the y -values under the original y -value column in the table below.

Next record the inverses of each point by switching the x - and y -values and recording the results in the inverse columns in the table below.



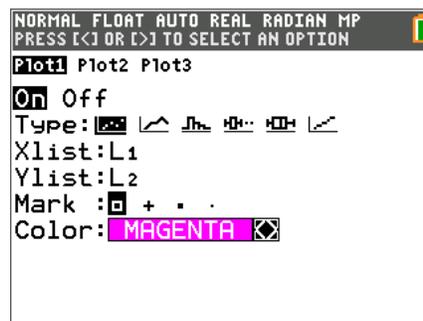
NORMAL FLOAT AUTO REAL RADIAN MP					
PRESS + FOR Δ Tbl1					
X	Y1				
0	1				
1	2.7183				
2	7.3891				
3	20.086				
4	54.598				
5	148.41				
6	403.43				
7	1096.6				
8	2981				
9	8103.1				
10	22026				

X=0

Original x-value	Original y-value	Inverse x-value	Inverse y-value
-2			
-1			
0			
1			
2			
3			

Now, plot out these inverse points by pressing $\boxed{\text{stat}}$ $\boxed{\text{enter}}$ and entering the inverse values in **L1** and **L2**.

To set up the scatter plot of the two lists, press $\boxed{2\text{nd}}$ $\boxed{\text{stat plot}}$ and match the screen to the right. Now press $\boxed{\text{graph}}$ to observe the plotted values.





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3. What do you notice about the plotted values?

Graph the equation $y = x$ to test your observation.

4. Find the inverse of $y = e^x$. This is done by switching x and y (exchanging the input with the output) in the equation and solve for y .

Check your result by graphing this result to see if it passes through all the plotted points.

Extension – Reflecting $y = 10^x$

Repeat the process of the activity, but use $y = 10^x$.

5. Find the inverse of $y = 10^x$.