 Exponential functions

What do the graphs look like?

Use Desmos or other graphing software to graph the following and look at the shape of the graphs.

This is an image of the above six functions that have been graphed on Desmos.

Definition

All the above graphs are exponential functions.

An exponential function is a function in the form and , where

By looking at the graphs drawn above, complete the statements about the shape of an exponential function.

If the function is in the form :

* The graph goes through the axis at 1
* As values get more negative, the values approach zero

As values get more positive, the values get really big

* As gets bigger, the graph becomes closer to the y-axis/steeper

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Using the information

Using the definition of the function, choose which of the following are exponential functions:

No

Yes

No

Yes

By looking at the shape of the graphs of the above functions, choose which of the following are exponential functions:

Graph

Yes

Graph

NoGraph

No

Graph

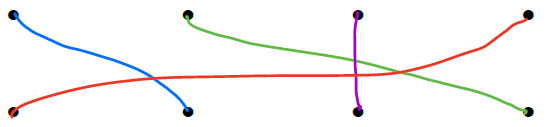
NoGraph

Yes

Graph

Yes

Match the equation with its graph:



Graph

Graph

Graph

Graph

Complete the following table of values and use the points to graph the exponential curve.

|  | -3 | -2 | -1 | 0 | 1 | 2 |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 1 | 3 | 9 |

On the calculator:

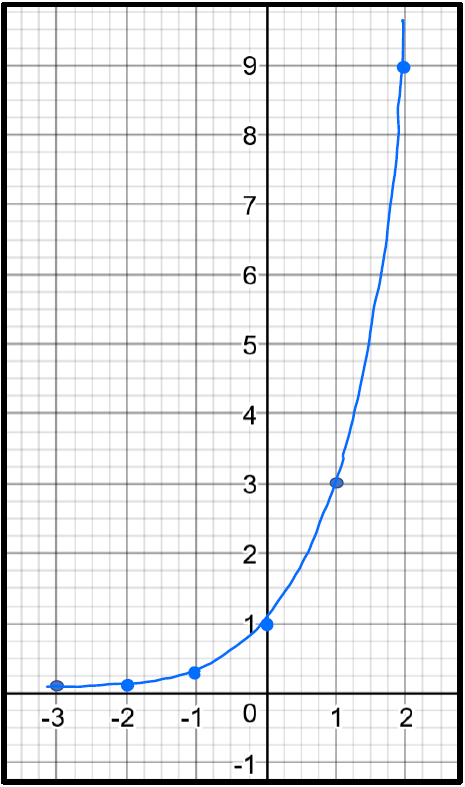
Image of buttons to press on a calculator to perform the calculation. Press the number three, followed by power of x button, then the negative button, then the number three again, the equal sign, and finally the button to switch from fractions to decimals.

Plot as (-3, 0.037)

On the calculator:

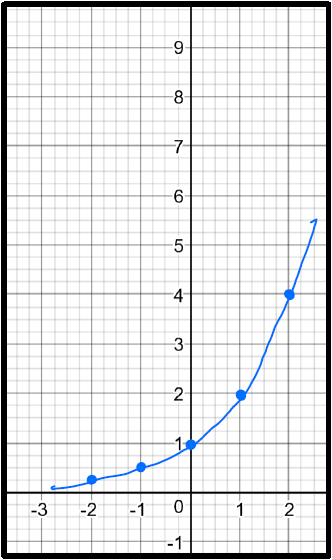
Image of buttons to press on a calculator to perform the calculation. Press the number three, followed by power of x button, then the number one, and finally the equal sign.

1. Plot each point.
2. Join the plotted points with a curved line.
   * Note – To make a smooth curve, place your wrist on the paper on the inside of the curve and use it as a pivot point when drawing.



Try graphing these:

|  | -2 | -1 | 0 | 1 | 2 |
| --- | --- | --- | --- | --- | --- |
|  | 0.25 | 0.5 | 1 | 2 | 4 |



|  | -2 | -1 | 0 | 1 | 2 |
| --- | --- | --- | --- | --- | --- |
|  | 9 | 3 | 1 |  |  |

