

Exponential Growth

Time required
0 minutes

Activity Overview

The purpose of this exploration is to investigate properties of exponential functions including the relationship between graphical and algebraic forms of the function.

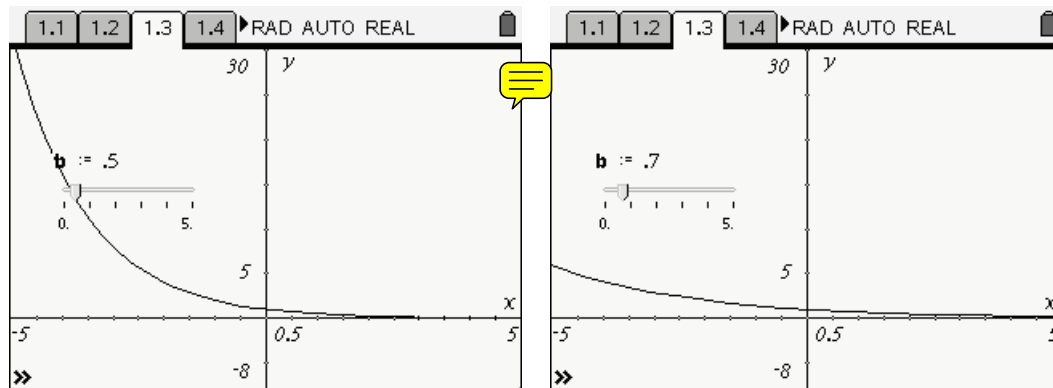
Materials

- *Technology:* TI-Nspire handheld, TI-Nspire CAS handheld, or TI-Nspire computer software
- *Documents:* Exponential_Growth.tns, Exponential_Growth_Student.doc

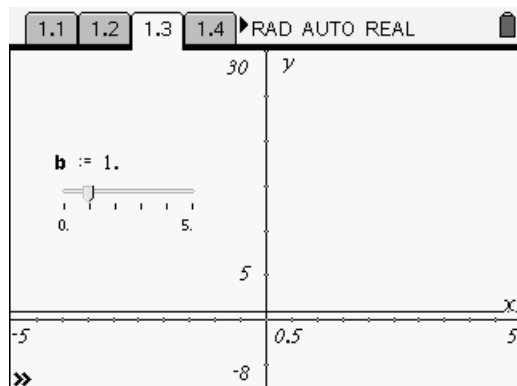


Exponential Growth — Student Solutions

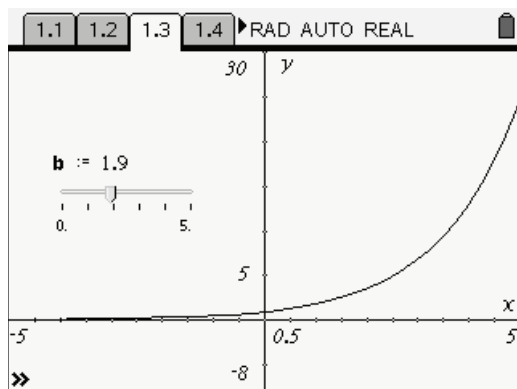
1. a. Students should respond that these functions are decreasing and that when a fraction between 0 and 1 is raised to higher positive powers, it gets smaller. When it is raised to negative powers, the reciprocal gives a number larger than 1, and thus on the left of the origin, the graph takes on larger y-values as x tends to negative infinity.



- b. The graph is a constant function. The graph is $y = 1$ since $1^x = 1$.

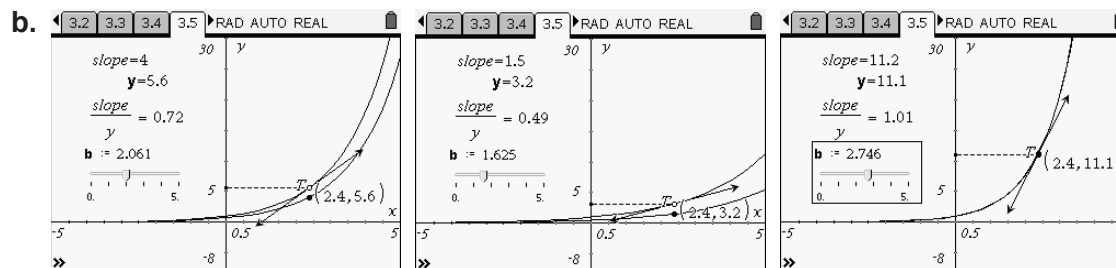


c. Here, since $b > 1$, as x increases, so will the function.



d. If $b < 0$, then we would have negative numbers raised to exponents. If the exponents are real numbers, they may not always yield a real number for the function.

2. a. Slope is always positive and always increases.
b. Slope can't be negative or zero, since the function is always increasing.
3. a. It seems to move in a similar path as the original function.



c. The number is e .