7-6 Reteaching (continued)

Exponential Functions

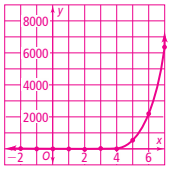
1. For each of the tables on the previous page, extend them two units in each direction. Use the common difference in the x-values and the common ratio in the y-values to do the extension. The first table is done for you.

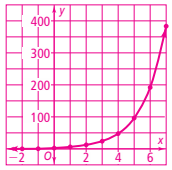
x	y
-2	$\frac{1}{3}$
-1	1
0	3
1	9
2	27
3	81
4	243
5	729
6	2187
7	6561

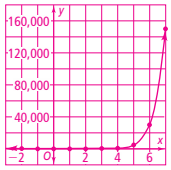
x	y
−2	0.75
−1	1.5
0	3
1	6
2	12
3	24
4	48
5	96
6	192
7	384

x	y
−2	0.08
−1	0.4
0	2
1	10
2	50
3	250
4	1250
5	6250
6	31,250
7	156,250

2. Plot the points in each of your extended tables on separate coordinate grids. Connect the points with a smooth curve. The domain of each function is all real numbers and that the range is all positive real numbers. Explain why there are negative values for x but not for y.







The domain is all real numbers because x can have any value, but the range is all positive real numbers because $a \geq 0$ and $b^x \geq 0$, so $a \cdot b^x$ will always be ≥ 0.

3. For each of the tables, identify the starting value a and the common ratio b. For the first table, a is 1 and b is 3. Next, write the exponential function that describes each table. The function for the first table is $f(x) = 1 \cdot 3^x$. Check if your function is correct by substituting in x-values and seeing if the function produces values for y that match the values in the table.

Table 1: 1; 3; $1 \cdot 3^x$; Table 2: 3; 2; $3 \cdot 2^x$; Table 3: 2; 5; $2 \cdot 5^x$;