

Comparing Linear and Exponential Equations

Let's fill out the table to compare linear, quadratic and exponential functions over time.

x	Linear $y = 2x + 2$	Quadratic $y = x^2 + 2$	Exponential $y = 2^x$
0			
1			
2			
3			
4			
5			

- Calculate and compare the slopes for each function from $x_1 = 0$ to $x_2 = 1$.

Linear's R.O.C	Quadratic's R.O.C.	Exponential's R.O.C.
Whose R.O.C. is the steepest?		

- Calculate and compare the slopes for each function from $x_1 = 2$ to $x_2 = 3$.

Linear's R.O.C	Quadratic's R.O.C.	Exponential's R.O.C.
Whose R.O.C. is the steepest?		

- Calculate and compare the slopes for each function from $x_1 = 4$ to $x_2 = 5$.

Linear's R.O.C	Quadratic's R.O.C.	Exponential's R.O.C.
Whose R.O.C. is the steepest?		

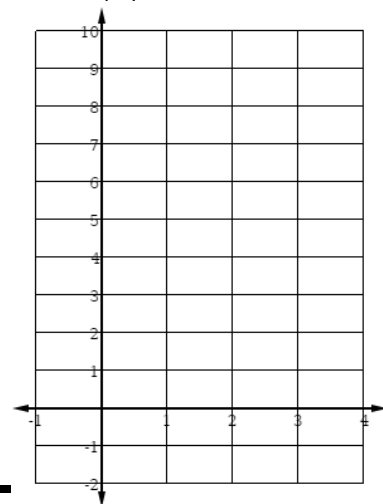
★VERY IMPORATANT TO KNOW!

Conclusion over a LONG period of time the _____ function will exceed the value of the other functions.

Which function increases faster, $f(x) = 2x + 1$ or $g(x) = 2^x - 1$? Make a table of values to help you decide.

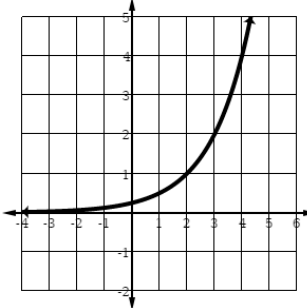
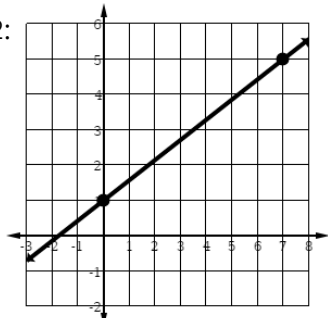
x	$f(x) = 2x + 1$
-1	
0	
1	
2	
3	
4	

x	$g(x) = 2^x - 1$
-1	
0	
1	
2	
3	
4	



Where will the two functions intersect?

Compare each pair of functions based on their rate of change or y-intercept. Shade the correct statement at the bottom of each box in green.

<p>1. Function 1:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th>x</th><th>y</th></tr> <tr><td>-6</td><td>0</td></tr> <tr><td>-5</td><td>3</td></tr> <tr><td>-4</td><td>6</td></tr> <tr><td>-3</td><td>9</td></tr> </table> <p>Function 2: $y = 5x - 7$</p>	x	y	-6	0	-5	3	-4	6	-3	9	<p>2. Function 1:</p>  <p>Function 2: $y = \frac{1}{2}x + 1$</p>	<p>3. Function 1:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th>x</th><td>2</td><td>9</td><td>16</td><td>23</td></tr> <tr><th>y</th><td>0</td><td>4</td><td>8</td><td>12</td></tr> </table> <p>Function 2:</p> 	x	2	9	16	23	y	0	4	8	12
x	y																					
-6	0																					
-5	3																					
-4	6																					
-3	9																					
x	2	9	16	23																		
y	0	4	8	12																		
<p>Function 2 has a greater rate of change.</p>	<p>Function 1 and Function 2 have the same rate of change.</p>	<p>Function 1 has a greater rate of change on the interval [2,4]</p>	<p>Function 2 has a greater rate of change on the interval [2,4]</p>	<p>Function 2 has a greater rate of change.</p>	<p>Function 1 and Function 2 have the same</p>																	

4. For each representation below, determine if they are linear or exponential, and then write the equations.

Problem 1, Function 1	Problem 2, Function 1	Problem 3, Function 2
Linear or Exponential?	Linear or Exponential?	Linear or Exponential?
$f(x) =$	$f(x) =$	$f(x) =$

5. What is the key in determining if a scenario is linear or exponential? Circle ALL of the exponential representations above in blue, and put a box around the linear representations in red.

6. Based on the graph on the right, which statement is not true?

- A. Functions f and g have the same x-intercept.
- B. The ordered pair $(1, 2)$ is a solution for $f(x)$.
- C. The ordered pair $(2, 7)$ is a solution for $g(x)$.
- D. The value of $f(x)$ begins to exceed $g(x)$ during the interval $x = 1$ and $x = 2$.

