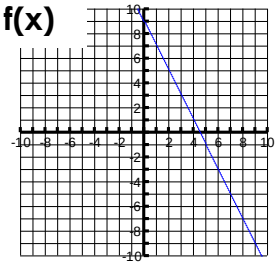
Name: _____ Date: _____

Comparing Linear and Exponential Functions

1. The functions f(x) and g(x) are described below. Compare the **rate of change** and **intercepts** of each.

f(x)



Rate of Change:

y-intercept:

x-intercept:

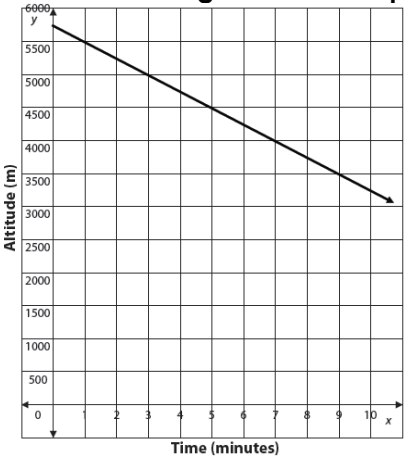
ROC:

y-int:

x-int:

x	g(x)
-2	-10
-1	-8
0	-6
1	-4

2. Two airplanes are in flight. The function f(x) = -100x + 3,350 represents the altitude, f(x), of one airplane after x minutes. The graph below represents the altitude of the second airplane, g(x). Compare the **rate of change** and **intercepts** of the functions.



f(x)

ROC:

y-int:

x-int:

g(x)

ROC:

y-int:

x-int:

Would the two planes ever be at the same altitudes?

3. Compare the **rate of change** of each function.

Function A

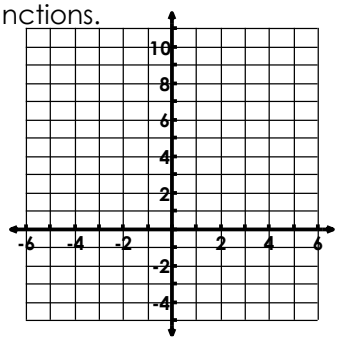
Number of beverages sold (x)	Profit ($f(x)$)
0	0
25	29.25
50	58.50

Function B

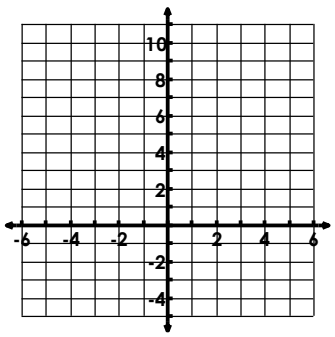
For each hamburger sold, the restaurant makes $0.40.

4. Graph the two functions.

$f(x) = \left(\frac{1}{2}\right)^x$

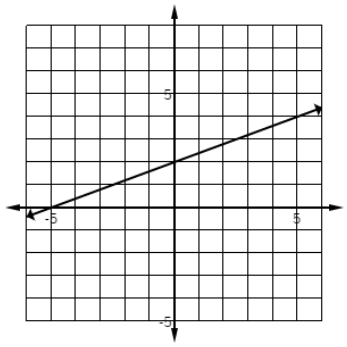
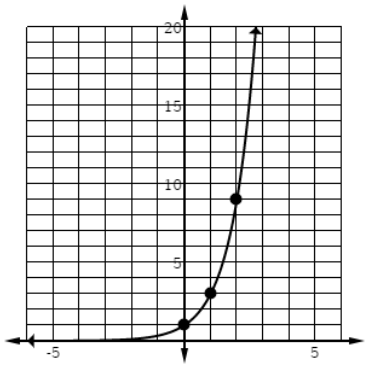


$f(x) = 2^x$



a. Which function has a greater **rate of change** over the interval **[0, 5]**?

Determine if the following representations are linear or exponential, identify the characteristics, and then write an equation.

<table>
<tr>
<td>5.
 
</td>
<td>6.
Kate started with 500 Instagram followers. Each week, she gained 150 more.</td>
<td>7.
 
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<tr>
<td>Linear or Exponential
ROC from [0,5]:
x-intercept:
y-intercept:
Equation: f(x) =</td>
<td>Linear or Exponential
ROC from [0,4]:
x-intercept:
y-intercept:
Equation: f(x) =</td>
<td>Linear or Exponential
ROC from [1,2]:
x-intercept:
y-intercept:
Equation: f(x) =:</td>
</tr>
<tr>
<td><table><tr><td>X</td><td>-1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>1/2</td><td>2</td><td>8</td><td>32</td></tr></table></td>
<td>9.
Diego had 2 YouTube followers on his music channel. He dropped a new single, and each day after, his number of subscribers tripled.</td>
<td><table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>9</td><td>6</td><td>3</td><td>0</td><td>-3</td></tr></table></td>
</tr>
<tr>
<td>Linear or Exponential
ROC from [0,2]:
x-intercept:
y-intercept:
Equation: f(x) =</td>
<td>Linear or Exponential
ROC from [0,5]:
x-intercept:
y-intercept:
Equation: f(x) =:</td>
<td>Linear or Exponential
ROC from [2,5]:
x-intercept:
y-intercept:
Equation: f(x) =</td>
</tr>
</table>