

# KEY

Math Plus Honors

Exponential Functions Homework (8 total questions)

#1 - 3

| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>.889</td></tr> <tr><td>1</td><td>2.67</td></tr> <tr><td>0</td><td>8</td></tr> <tr><td>1</td><td>24</td></tr> <tr><td>2</td><td>72</td></tr> </table> | x     | y  | -2 | .889  | 1 | 2.67 | 0 | 8 | 1 | 24 | 2 | 72 | <p>Initial Value<br/><b>8</b></p> <p>Growth Factor<br/><b>3</b></p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>.061</td></tr> <tr><td>1</td><td>.429</td></tr> <tr><td>0</td><td>3</td></tr> <tr><td>1</td><td>21</td></tr> <tr><td>2</td><td>147</td></tr> </table> | x | y | -2 | .061 | 1 | .429 | 0 | 3 | 1 | 21 | 2 | 147 | <p>Initial Value<br/><b>3</b></p> <p>Growth Factor<br/><b>7</b></p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>.0097</td></tr> <tr><td>-1</td><td>.078</td></tr> <tr><td>0</td><td>.625</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>40</td></tr> </table> | x | y | -2 | .0097 | -1 | .078 | 0 | .625 | 1 | 5 | 2 | 40 | <p>Initial Value<br/><b>.625</b></p> <p>Growth Factor<br/><b>8</b></p> |
|--|-------|--|----|---|---|------|---|---|---|----|---|----|---|---|---|---|----|------|---|------|---|---|---|----|---|-----|---|--|---|---|----|-------|----|------|---|------|---|---|---|----|--|
| x  | y     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| -2   | .889  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 1  | 2.67  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 0  | 8     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 1  | 24    |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 2  | 72    |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| x  | y     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| -2   | .061  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 1  | .429  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 0  | 3     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 1  | 21    |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 2  | 147   |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| x  | y     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| -2   | .0097 |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| -1   | .078  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 0  | .625  |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 1  | 5     |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| 2  | 40    |  |    |   |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |
| $f(x) = 8(3)^x$<br>$f(5) = 8(3)^5 = 1944$  |       | $f(x) = 3(7)^x$<br>$f(5) = 3(7)^5 = 16807$ |    | $f(x) = .625(8)^x$<br>$f(5) = .625(8)^5 = 32,768$ |   |      |   |   |   |    |   |    |   |   |   |   |    |      |   |      |   |   |   |    |   |     |   |  |   |   |    |       |    |      |   |      |   |   |   |    |  |

4)  $f(x) = 2(4)^x$

| x  | f(x) |
|----|------|
| -2 | .125 |
| -1 | .5   |
| 0  | 2    |
| 1  | 8    |
| 2  | 32   |

What is the y-intercept? **(0, 2)**

What is the multiplier/common ratio? **4**

5. Write an exponential function given the following table:

$$y = 4\left(\frac{1}{2}\right)^x$$

|          | <b>4</b> |
|----------|----------|
| <b>0</b> | <b>4</b> |
| x        | y        |
| 1        | 2        |
| 2        | 1        |
| 3        | .5       |
| 4        | .25      |
| 5        | .125     |

$\times \frac{1}{2}$   
 $\times \frac{1}{2}$   
 $\times \frac{1}{2}$   
 $\times \frac{1}{2}$

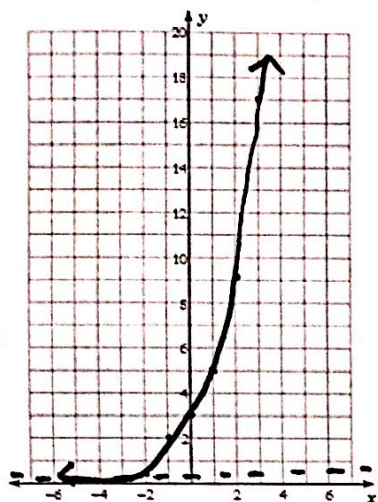
6. Given  $f(x) = \left(\frac{1}{4}\right)^x$ , identify the growth/decay factor, growth/decay rate, and the

Growth/Decay Factor .25 or 1/4  
 Growth/Decay Rate 75% decay  
 Initial Value 1

Sketch the graph of each function. List the y-intercept and any transformations that may have occurred.

7)  $y = 2 \cdot 2^x + 1$       down 1

growth



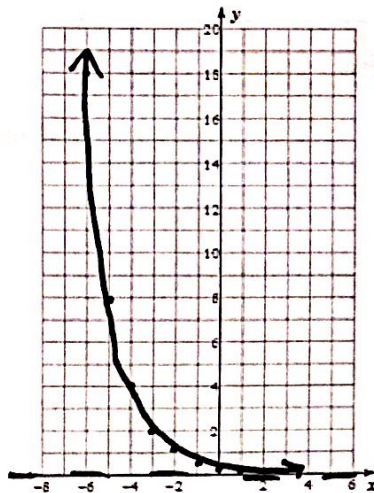
$y=1$   
asymptote

| X  | Y    |
|----|------|
| -3 | 1.25 |
| -2 | 1.5  |
| -1 | 2    |
| 0  | 3    |
| 1  | 5    |
| 2  | 9    |
| 3  | 17   |

(0, 3) y-int.

8)  $y = \frac{1}{2} \cdot \left(\frac{1}{2}\right)^{x+1}$       left 1

decay



$y=0$  asymptote

| X  | Y     |
|----|-------|
| -6 | 16    |
| -5 | 8     |
| -4 | 4     |
| -3 | 2     |
| -2 | 1     |
| -1 | 1/2   |
| 0  | .25   |
| 1  | .125  |
| 2  | .0625 |

(0, 1/4) y-int.