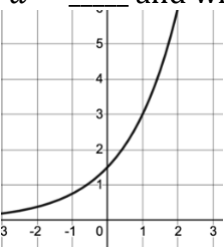


Circuit Training – The Exponential Function (precalculus)

Name _____

Directions: Begin in cell #1. Show the work necessary to answer the question. Use **separate paper** if necessary. Circle your answer, then search for it. Call that cell #2 and continue in this manner until you complete the circuit (get back to the beginning).

NOTE: Starting on question number 15, you may use a calculator.

<p># <u>1</u> Answer: 567</p> <p>A truck purchased for \$20000 depreciates at a rate of 11% annually. What is the value of b in the equation $y = 20000(b)^x$?</p>	<p># _____ Answer: 3</p> <p>The graph of $f(x) = 7^x$ contains the point (2, 49). The graph of $f(x - 2)$ contains the point (1, ?).</p>														
<p># _____ Answer: - 13</p> <p>The following table gives the square yards of kudzu in a meadow at select years. Write the exponential equation that models this situation and use it to predict the square yards of kudzu in year 6.</p> <table border="1" data-bbox="110 919 797 997"> <thead> <tr> <th>year</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>yd^2</td> <td>40</td> <td>60</td> <td>80</td> <td>120</td> <td>150</td> <td>200</td> </tr> </tbody> </table>	year	0	1	2	3	4	5	yd^2	40	60	80	120	150	200	<p># _____ Answer: 2.8</p> <p>A bacteria colony triples every six hours. A small colony of only 7 bacteria grows to how large in one day?</p>
year	0	1	2	3	4	5									
yd^2	40	60	80	120	150	200									
<p># _____ Answer: 5.5</p> <p>Solve for x: $\frac{1}{4} = 32^{x-4}$</p>	<p># _____ Answer: 11</p> <p>What is the range of $y = -2^x + 5$?</p> <p>If $(-\infty, 5)$... go to answer $\frac{4}{3}$.</p> <p>If $(5, \infty)$... go to answer 288.</p>														
<p># _____ Answer: 7</p> <p>Given the graph of $f(x) = a(b)^x$, determine what $a =$ _____ and what $b =$ _____.</p>  <p>To advance in the circuit, search for the product of a and b.</p>	<p># _____ Answer: 5</p> <p>What is the equation of the asymptote for the graph of $y = -2\left(\frac{3}{5}\right)^{x+5} + 7$?</p> <p>$y = -2$ go to answer 567</p> <p>$y = \frac{3}{5}$ go to answer 290</p> <p>$y = 5$ go to answer 279</p> <p>$y = 7$ go to answer 252</p>														
<p># _____ Answer: 279</p> <p>A \$2000 truck depreciates at a rate of 17% annually. How much is it worth (in dollars) in 10 years?</p>	<p># _____ Answer: 288</p> <p>A \$250 investment compounded quarterly at a 3% interest rate will be worth how much (in dollars) after 5 years?</p>														

<p># _____ Answer: 290</p> <p>A \$240 investment compounded continuously at a 3% interest rate will be worth how much (in dollars) after 5 years?</p>	<p># _____ Answer: 310</p> <p>At what annual interest rate should you invest if you want your money to double in 25 years?</p>
<p># _____ Answer: $\frac{2}{5}$</p> <p>Given $\frac{2}{6^a} \cdot 216^{a-4} \cdot \frac{1}{2}(6)^{-3a} = 6^{ka+b}$, $k + b = ?$</p>	<p># _____ Answer: 0.89</p> <p>Solve $25^{x+2} = 125^{x^2+1}$.</p> <p>There are two solutions. _____ and _____. To advance in the circuit, find the <i>sum</i> of the solutions.</p>
<p># _____ Answer: $\frac{1}{7}$</p> <p>Given $g(x) = 3^x$, $g(-x)$ is a reflection of $g(x)$ across the _____.</p> <p>If x – axis, go to answer $\frac{18}{5}$. If y – axis, go to answer 5.5.</p>	<p># _____ Answer: $\frac{18}{5}$</p> <p>Solve for k: $27^a \cdot 9^{5a+1} \cdot \left(\frac{1}{3}\right)^{2a} = 3^{ka+2}$.</p>
<p># _____ Answer: $\frac{2}{3}$</p> <p>Consider the equation $y = 5 \cdot 3^{-x+1} + 2$.</p> <p>If this equation is exponential growth, go to answer $\frac{1}{7}$. If this equation is exponential decay, go to answer 7.</p>	<p># _____ Answer: 2</p> <p>The point (2, ?) is on the graph of the function $p(x) = 30(6)^{-x+1}$.</p>
<p># _____ Answer: $\frac{4}{3}$</p> <p>The expression $\frac{3^a e^{5a}}{e^a} + (3e^2)^a - \frac{3^a}{e^{-4a}}$ can be written as $3^a e^{ka}$. What does k equal?</p>	<p># _____ Answer: 252</p> <p>If $g(x) = \frac{2}{5} \cdot e^x$ and $f(x) = 3x^2 - 2x - 1$, then $g\left(f\left(-\frac{1}{3}\right)\right) =$</p>