

Math107 – Questions to try (Exam 3)

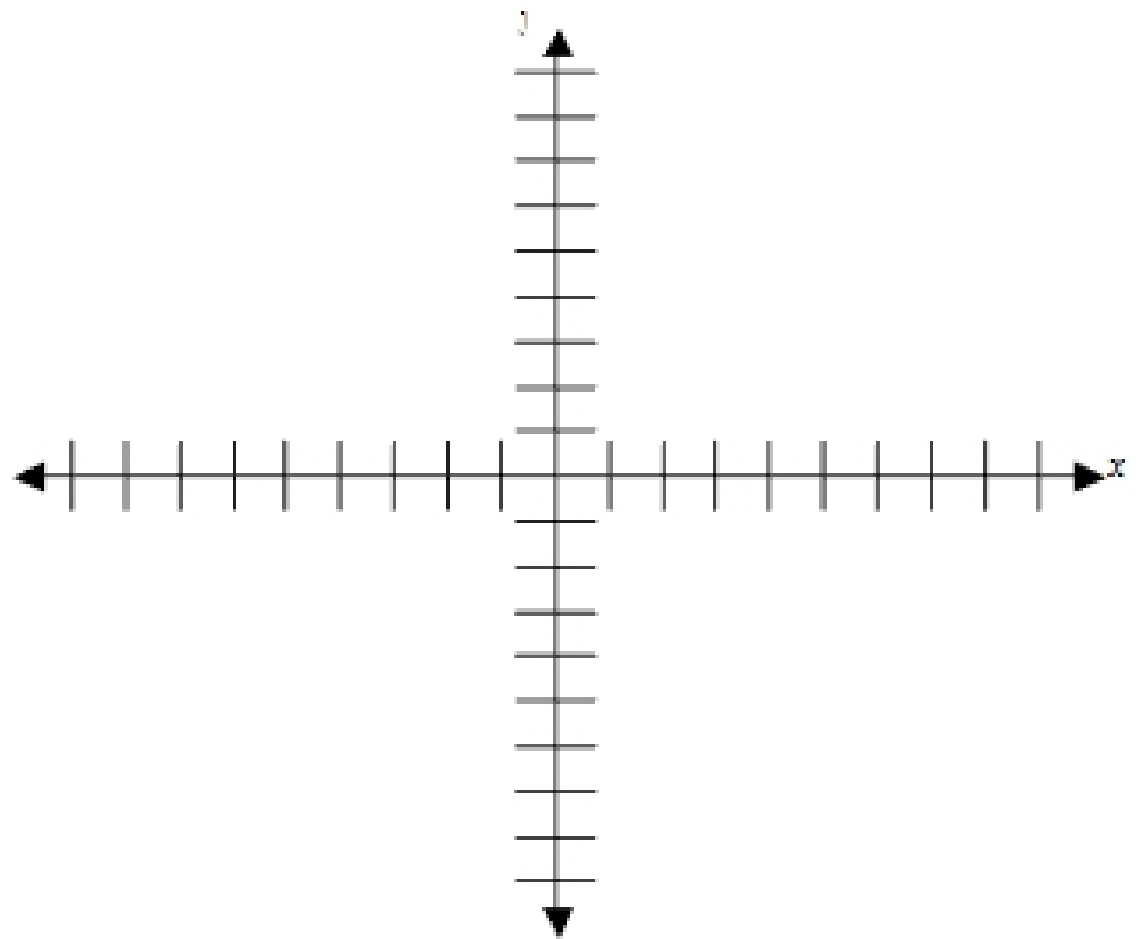
1. Find the x - and y -intercepts of the function $f(x) = -3^{2-x} + 9$ *exactly* (NO DECIMALS). *Show your work.*

x -intercept: _____

y -intercept: _____

2. Sketch a graph of the function $f(x) = -3^{2-x} + 9$. Label its pivot point, asymptote, x -intercept, and y -intercept accordingly on the graph.

Identify the common or parent function and use it to explain how you found the sketch of the graph.



3. Determine the Domain and the Range for the inverse function $f^{-1}(x)$ if $f(x) = -3^{2-x} + 9$.

Domain of $f^{-1}(x)$: _____

Range of $f^{-1}(x)$: _____

4. Find the inverses $f^{-1}(x)$ and $g^{-1}(x)$ of the following functions. **BOX YOUR ANSWERS.** *Show your work.*

(a) $f(x) = -2^{x+5} + 9$

(b) $g(x) = \log_5(2 - x) + 4$

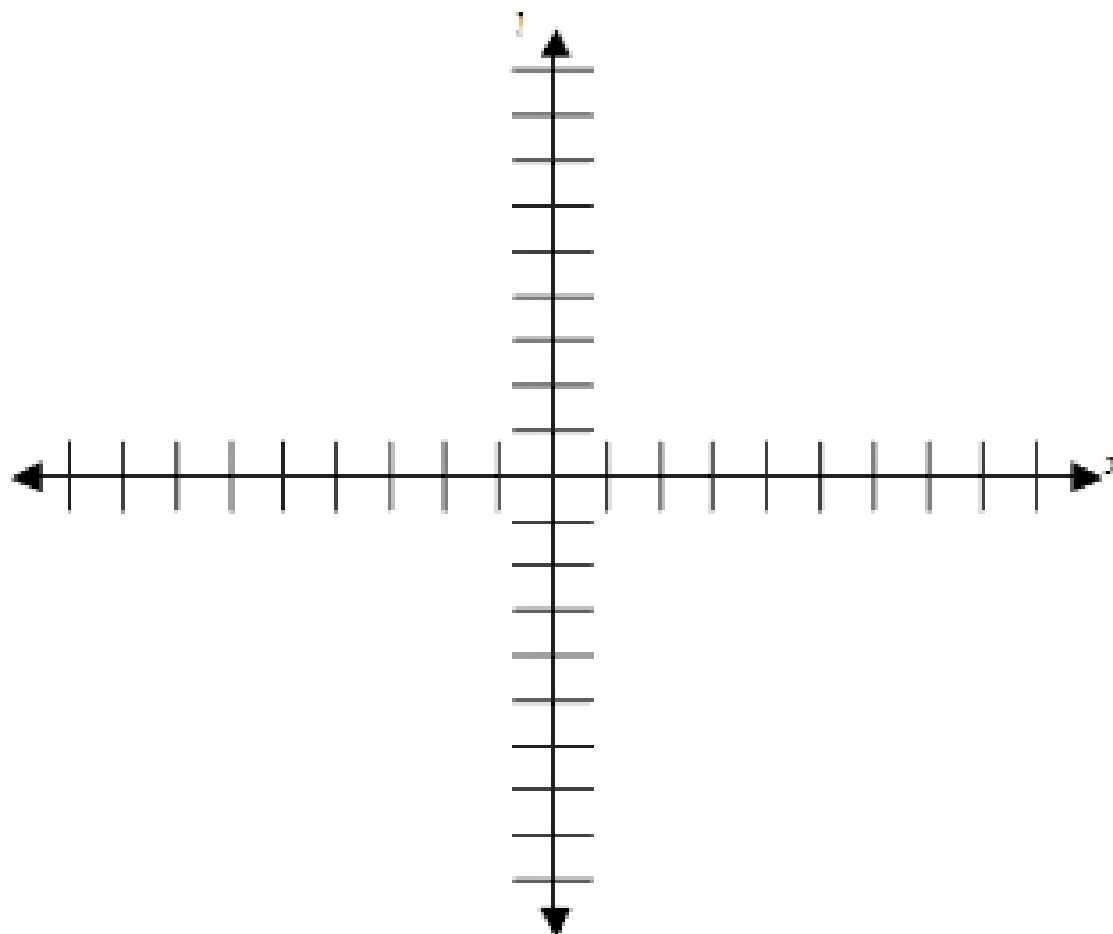
5. Find the x - and y -intercepts of the function $g(x) = -\log_2(x + 8) + 1$ *exactly* (NO DECIMALS). *Show your work.*

x -intercept: _____

y -intercept: _____

6. Sketch a graph of the function $g(x) = -\log_2(x + 8) + 1$. Label its pivot point, asymptote, x -intercept, and y -intercept accordingly on the graph.

Identify the common or parent function and use it to explain how you found the sketch of the graph.



7. Determine the Domain and the Range for the function $g(x) = -\log_2(x + 8) + 1$.

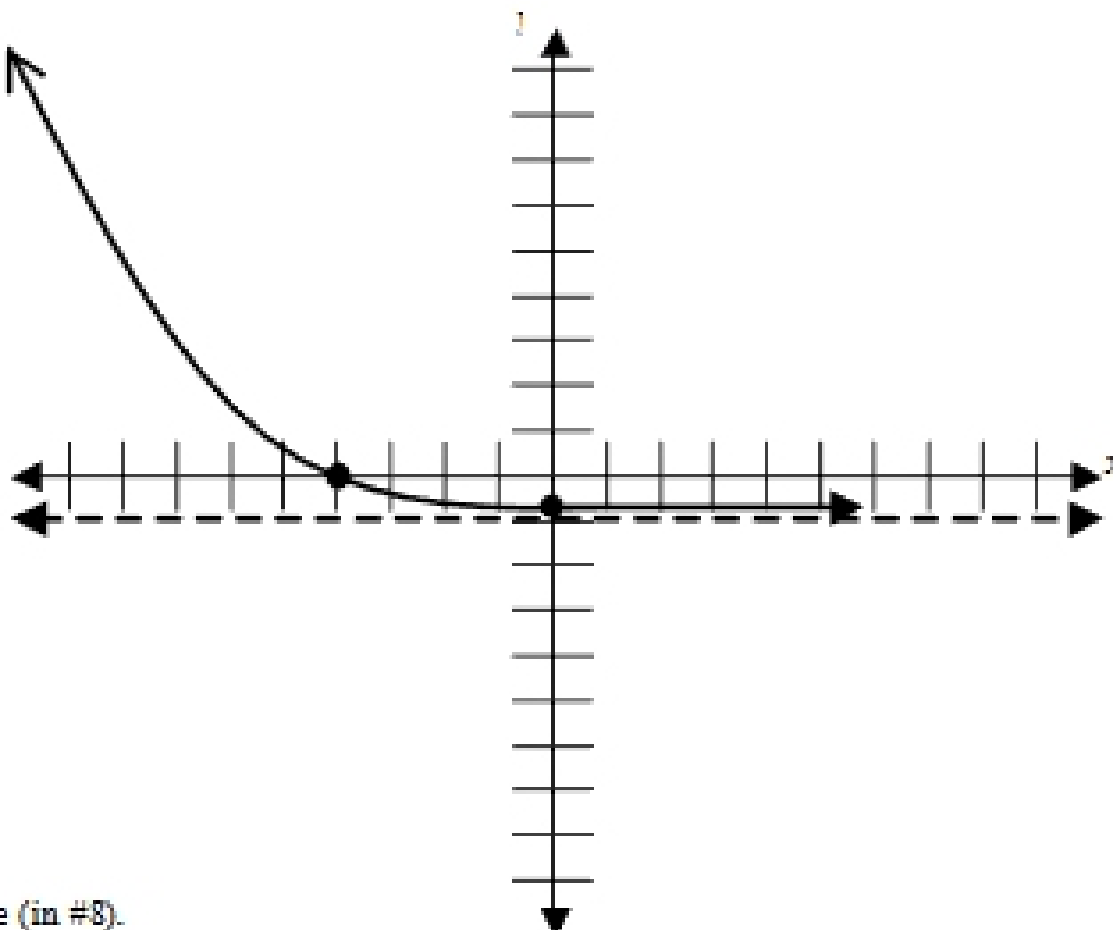
Domain of $g(x)$: _____

Range of $g(x)$: _____

8. Given the graph of $h(x) = 3^{-x-4} - 1$, sketch a graph of its inverse function $h^{-1}(x)$ on the same axes without finding the equation of the inverse function.

Find the exact y -intercept of $h(x)$.

Label any asymptotes and intercepts of the inverse function accordingly on the graph.



9. Determine the Domain and the Range for $h(x)$ and $h^{-1}(x)$ above (in #8).

10. Find the equation of the inverse function of $h(x) = 3^{-x-4} - 1$. After finding the inverse function, identify the common or parent function and use it to explain how you would sketch the graph, describing where the asymptote and pivot point end up. Find the intercepts, using the equation that you found. Compare the results to the graph in #8.

11. Find the x - and y -intercepts of the function $f(x) = \left(\frac{1}{5}\right)^{x+1} - 25$ exactly (NO DECIMALS). *Show your work.*

x -intercept: _____

y -intercept: _____

12. Given the function $f(x) = \left(\frac{1}{5}\right)^{x+1} - 25$, identify the common or parent function and use it to explain how you would sketch its graph, describing where the pivot point and asymptote end up.

13. Find the equation of the function in the form $f(x) = ae^{bx}$, whose graph has the solution points (0, 5) and (4, 1).

14. Tell whether each statement is True or False. Explain why for each.

(a) $e = \frac{271,801}{99,990}$

(b) 4^x is always larger than 3^x , where x is a real number.

(c) $3^{x-2} = \frac{1}{9}(3^x)$

(d) $5^{3-x} = -5^{x-3}$

(e) $2^{2x+6} = (64)(4^x)$

(f) $3^{x+4} = 3^x + 81$

(g) $16(4^{-x}) = \left(\frac{1}{4}\right)^{x-2} = 16(2^{-2x})$