Practice for Exam 2

Honor Statement: I _____ understand that this is a closed notes, eyes on my own paper, no graphing calculator, no talking exam. I assure you and my fellow students that all of the work on this exam is my own and I will not cheat in any way, shape or form on this test.

I also agree that I will turn in this exam on time and not go over the time allotted.

Signed: _____

Be sure to show work. No partial credit can be given if you do not. If you do not show your work you will not be able to get full credit. If you use short cuts and/or tricks be sure to explain what you are doing. Box your final answers to distinguish your final answer to distinguish it from any relevant work used to get it. Come ask me if you don't understand any questions.

WAIT FOR ME TO ANNOUNCE THAT YOU SHOULD BEGIN THE TEST BEFORE TURNING THIS PAGE.

Problem 1 (5 Points)**.** *Use the log rules to find exact answers. Then (if needed) use your calculator to give an answer approximate to 3 decimal places.*

a) $\frac{\log_{\frac{1}{3}} 3}{\log_{\frac{1}{3}} 9}$

b) $\log_2 5$

c) $\log e$

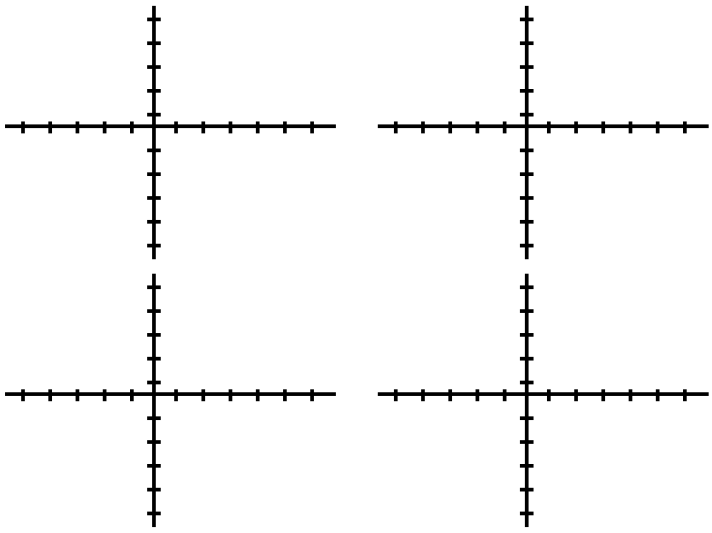
Problem 2 (10 points)**.** *Solve for x in the following problems.Give exact answers here do not use a calculator.*

a) (5 points) $4^x - 2^{x+3} = -12$

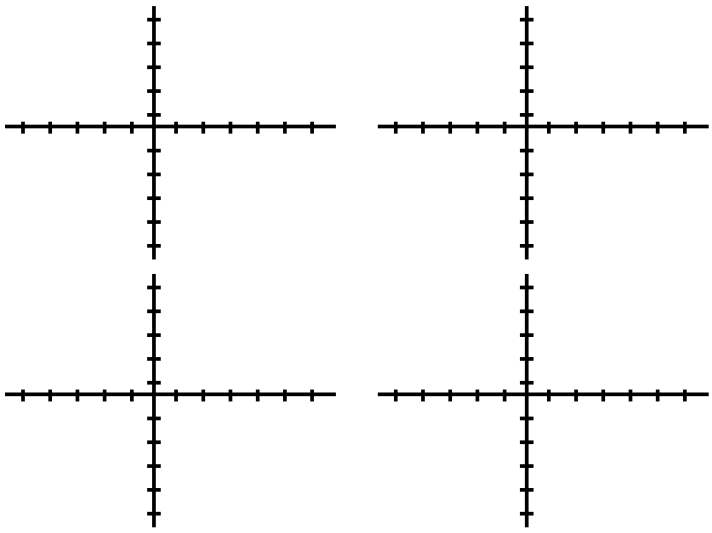
b) (5 points) $\pi^{1-4x} = (\frac{4}{5})^{x+2}$

Problem 3 (20 points)**.**

(10 points) a) Graph $f(x) = \log_2(x-2)+1$ using transformations. Label at least one point on each graph.



(10 points) b) Graph $g(x) = 2\log_{1/3}(x)+2$ using transformations. Label at least one point on each graph.



Problem 4 (15 points)**.** *Express the following as a single logarithm:*

(5 points)a) $\ln(x+3) + \ln(x-7)$

(5 points)b) $\frac{4}{3}\log(x-1) - \log(x+1)$

(5 points)c) $\log_2(x) + \frac{\log_3(x+7)}{\log_3 2}$

Problem 5 (20 points)**.** *Let* $R(x) = \frac{7x-3}{x^2-4}$

(3 points) a) What are the zeros of $R(x)$?

(3 points) b) What are the vertical asymptotes?

(2 points) c) What is the end behavior of R(x)?

(6 points) d) With $R(x) = \frac{7x-3}{x^2-4}$, use a t-chart (or the appropriate equivalent) to answer the following questions. What values of x make $R(x) > 0$ and what values make $R(x) < 0$?

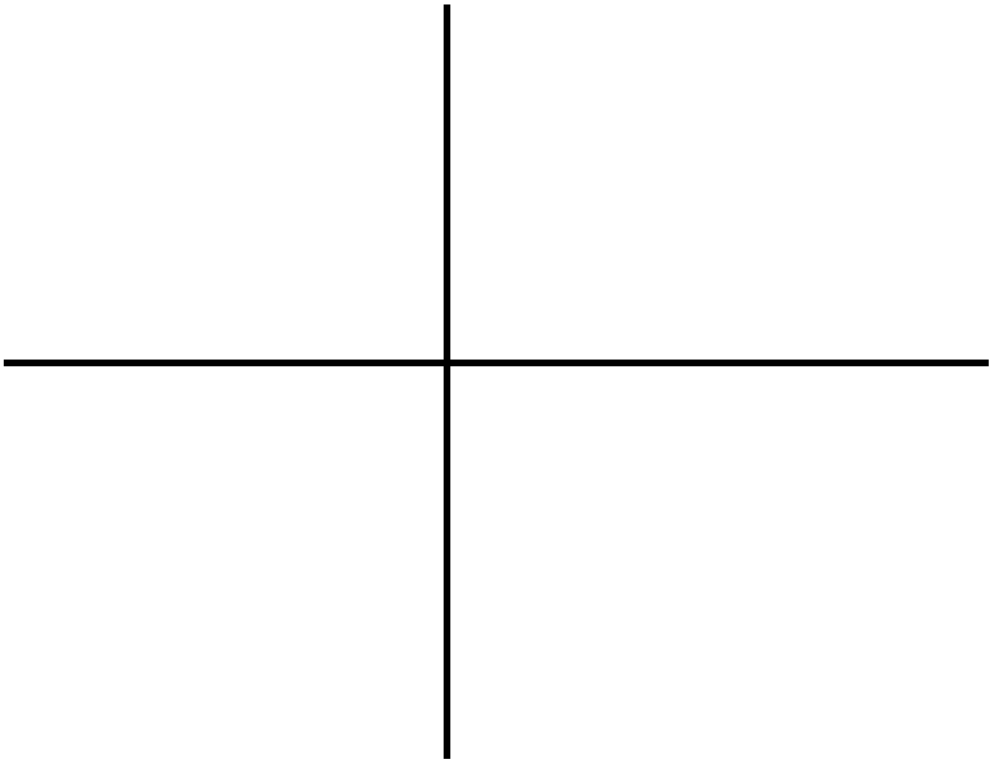
(6 points) e) Graph $R(x)$.

Problem 6 (20 points)**.**

(6 points) a) Find the inverse of $h(x) = \log(4x + 3)$.

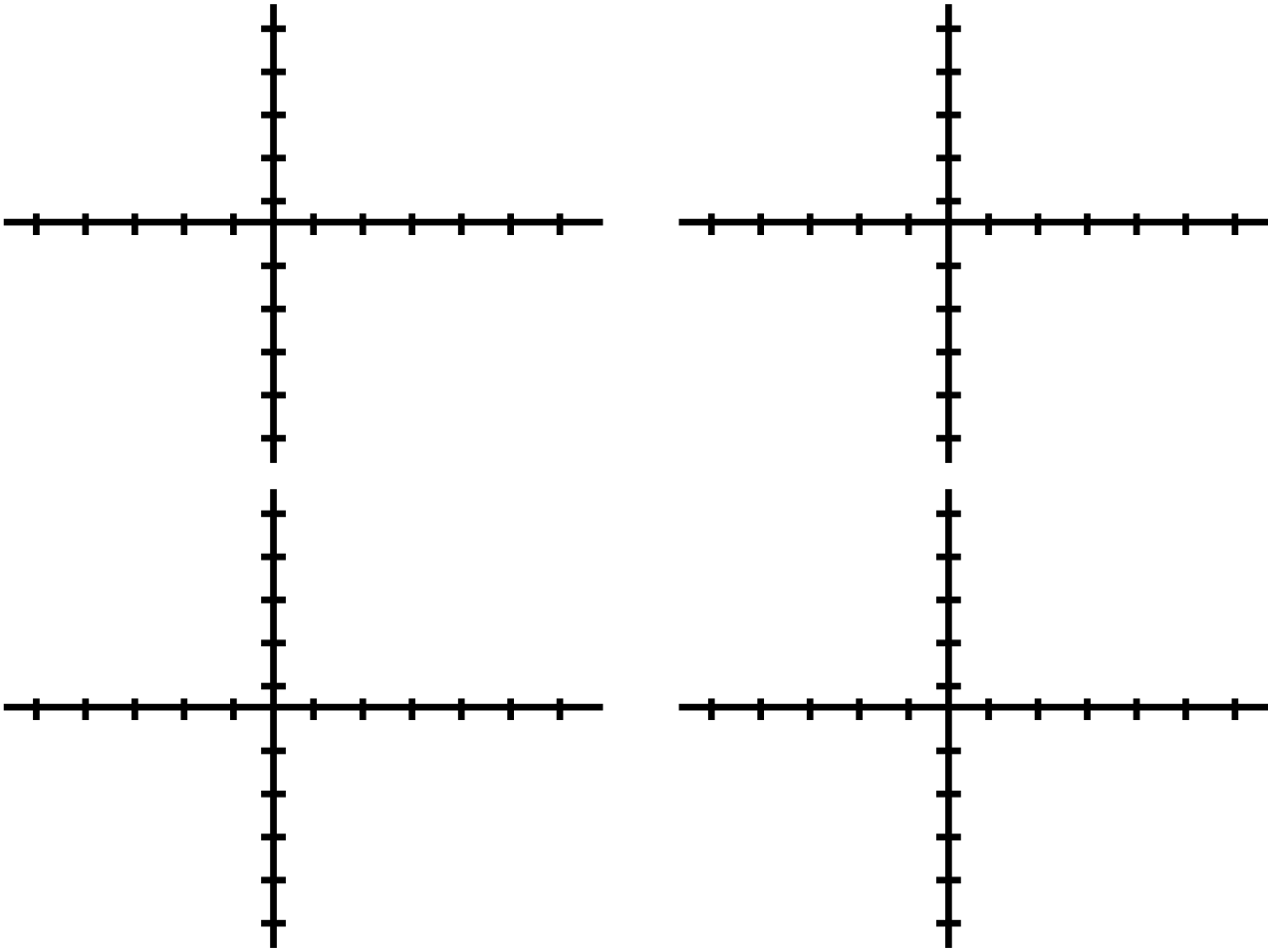
(6 points) b) Show that $(h \circ h^{-1})(x) = x$ and $(h^{-1} \circ h)(x) = x$. Use h^{-1} from part b) adjust part b) if necessary.

(8 points) c) Graph $h(x)$ and $h^{-1}(x)$ from part b).



(10 points)

Problem 7. *(8 points) a) Graph* $g(x) = \frac{2}{3x-1}$ *using transformations.*



b) Give the domain of $g(x)$. (2 points)

Problem 8 (10 points)**.** *If* $f(x) = (x-1)(x-2)(x-4)$ *and* $g(x) = -5x + 5$*. For what values of* x *is it true that* $f(x) < g(x)$*?*