MATH 30 - Precalculus. Homework 5. Due Th. 03/14/2024. Professor Luis Fernández

NAME:_____

DO NOT write your answers here, except the graphs. Do it in other sheets and **show all your work**. **STAPLE this sheet to your other sheets.**

1. For the following rational functions, first find

1. The end behaviour and the horizontal asymptotes, if any.
2. The vertical asymptotes.
3. The x-intercepts and their multiplicity.
4. The y-intercept.

Then **sketch the graph of the function** in the graph paper provided (or in your own).

a) $f(x) = \dfrac{x+1}{x-1}$

b) $f(x) = \dfrac{3x^2}{x^2-9}$

c) $f(x) = \dfrac{x-4}{x^2-x-6}$

$f(x) = \dfrac{2x+5}{x^3-13x+12}$

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2. Use a calculator to approximate the following numbers to 4 decimal places.

a) $2^{3.4} =$

b) $e^{1.5} =$

c) $6^{-\frac{1}{3}} =$

d) $\sqrt{3}^{\sqrt{2}} =$

e) $\log 12 =$

f) $\log \sqrt{5} =$

g) $\ln \frac{1}{5} =$

h) $\ln 469993 =$

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3. Find without using a calculator.

a) $\log_2 8 =$

b) $\log_3 \frac{1}{3} =$

c) $\log_6 \sqrt{6} =$

d) $\log_{102} 102^4 =$

e) $\log_8 2 =$

f) $\log_{27} \frac{1}{3} =$

g) $\log_5 1 =$

h) $\log_3(\log_8 2) =$

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4. Simplify each expression. Here a is a positive number.

a) $\log_a a^4 =$

b) $\log_a \dfrac{1}{a^7} =$

c) $\log_a a^{\frac{1}{5}} =$

d) $\log_a \sqrt[3]{a} =$

e) $2^{\log_2 7} =$

f) $a^{\log_a \frac{1}{5}} =$

g) $10^{\log \sqrt{4}} =$

h) $e^{\ln 3x^2} =$

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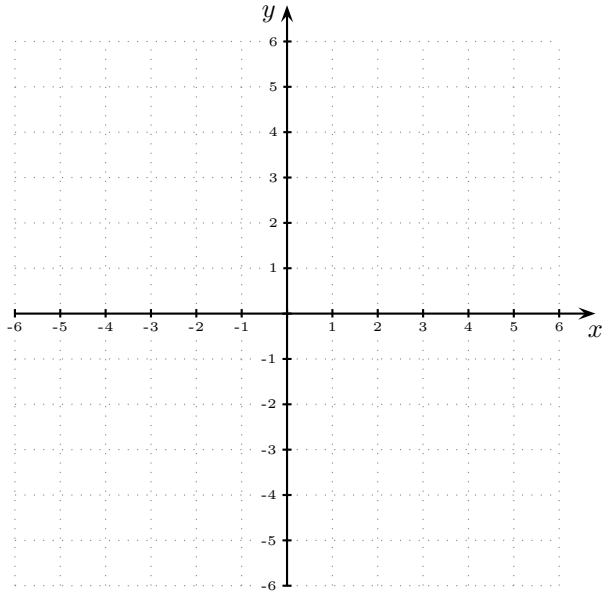
5. Graph the following functions in the axes provided (both in the same axes).

a) $f(x) = 2^x$ and $g(x) = \log_2 x$.



b) $f(x) = 2^{x-3} - 5$ and $g(x) = \log_2(x+5) + 3$.