MATH 30 - Precalculus. Homework 5. Due We. 03/13/2025. 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)** $\log_a \frac{1}{a^7} =$ **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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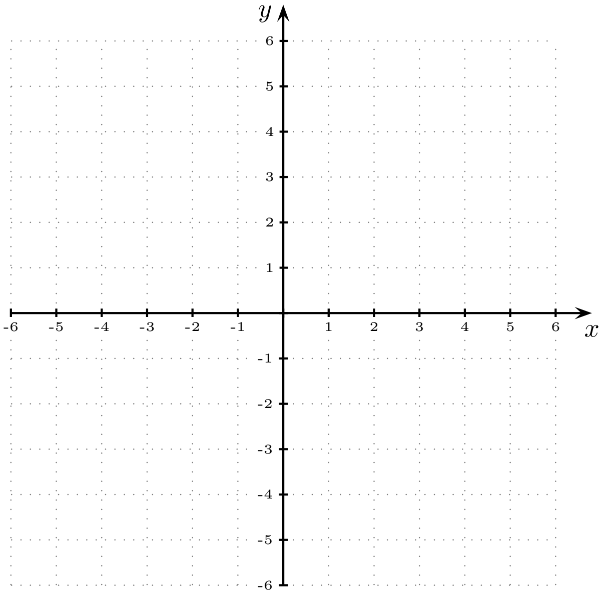
5. Graph the following functions in the axes provided (both in the same axes).

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



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