

In-Class Problems 14 for Wednesday, March 21

These problems are from [Pre-Class Problems 14](#).

1. Identify the horizontal asymptotes (if any). If the function has a horizontal asymptote, determine if the graph crosses the asymptote.

a. $h(x) = \frac{x^2 + 5x}{4x^2 + 9x - 12}$ b. $f(x) = \frac{x^3 - 6x^2 + 9}{2x^2 + 7x - 14}$

2. Determine the vertical and horizontal asymptotes for the graph of the following rational functions (if any). If the function has a horizontal asymptote, determine if the graph crosses the asymptote. Then sketch the graph of the rational function.

a. $f(x) = \frac{2x + 5}{3x - 7}$ b. $g(x) = \frac{8x}{x^2 - 16}$

3. Sketch the graph of the following functions. State the domain of the function and use the sketch to state the range of the function.

a. $f(x) = 5 \left(\frac{2}{3} \right)^{x-4}$ b. $y = 7^{t+4} + 2$

c. $g(x) = -4e^{-x} - 9$