Thursday Night PreCalculus, September 28, 2023

Rational Functions: Zeros, Holes, Vertical Asymptotes, and End Behavior

Problems

1. Find the location of any zeros and holes for the graph of the given rational function.

(a) $f(x) = \dfrac{x^3 - x^2 - 10x - 8}{x + 2}$

(b) $f(x) = \dfrac{(x+3)^2(x+1)(x-1)(x-4)}{x^2 + 2x - 3}$

2. Find the vertical asymptotes for the graph of the given rational function and sketch a complete graph.

(a) $f(x) = \dfrac{x^3 - 5x^2 + 6x}{x^2 - 9}$

(b) $f(x) = \dfrac{x^2 - 4}{(x-2)(x^2 - 6x + 5)}$

3. Express the end behavior of each rational function using limit notation and sketch a complete graph.

(a) $f(x) = \dfrac{10x}{x^2 + 4}$

(b) $f(x) = \dfrac{3x^2 - 15}{x^2 - 2x - 8}$

(c) $f(x) = \dfrac{x^3 - x}{x^2 - 4}$