§4.2 Graphs of Rational Functions

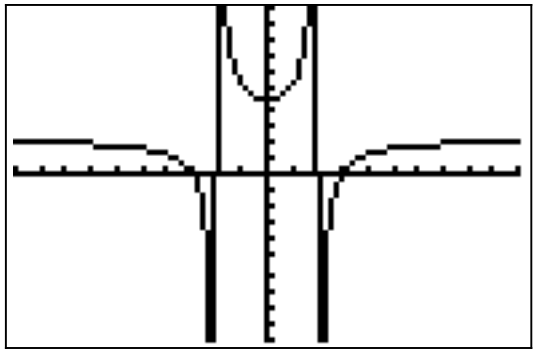
Guidelines for Graphing Rational Functions

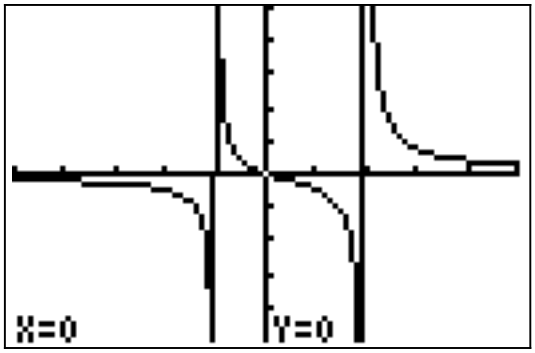
1. Find and plot the x-intercepts. (Set numerator = 0 and solve for x)
2. Find and plot the y-intercepts. (Let x = 0 and solve for y)
3. Find and plot the Vertical Asymptotes. (Set denominator = 0 and solve for x)
4. Find and plot the Horizontal Asymptotes. (Top heavy, Bottom heavy or Same)
5. Find and plot the Slant Asymptotes. (Divide numerator by denominator.)
6. Find where the graph will intersect its nonvertical asymptote by solving f(x) = k, where k is the y-value of the horizontal asymptote, or f(x) = mx + b, where y = mx + b is the equation of the oblique asymptote.
7. Plot at least one point between and beyond each x-intercept and vertical asymptotes.

Use smooth curves to complete the graph between and beyond the vertical asymptotes.

Example 4 Sketch the graph and provide information about intercepts and asymptotes.

a.) $f(x) = \dfrac{2(x^2 - 9)}{x^2 - 4}$ b.) $f(x) = \dfrac{x}{x^2 - x - 2}$ c.) $f(x) = \dfrac{x^2 - x - 2}{x - 1}$

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