Rational Polynomials: Graphing and Asymptotes

Find the intercepts, if there are any.
Step 1: Set the numerator to 0 to solve for horizontal intercepts.
Step 2: Set the x to 0 to solve for vertical intercept.
Step 3: Set the denominator to 0 to solve for vertical asymptotes.
Step 4: Perform a long division to find the quotient which specifies the oblique asymptote.

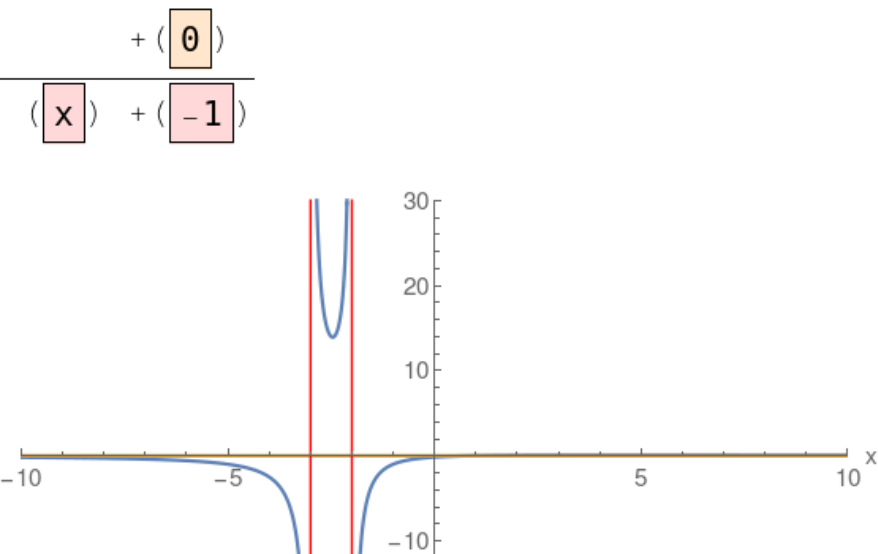
Note: Blue curve the actual Rational function.
Red and Gold asymptotes.

Example: Horizontal Asymptote

$$\frac{3x-1}{2x-5}$$

$$2x-5 \;\big|\; (3)x + (-1) + \left(\frac{3}{2}\right)$$

$$(3x) + \left(-\frac{15}{2}\right) + \left(\frac{13}{2}\right)$$



Example: Oblique Linear Asymptote

$$\frac{x(x+1)}{x+2}$$

$$x+2 \;\big|\; (1)x^2 + (1)x + (1)$$

$$(x^2) + (2x) + (-1)x + (-2)$$

$$(-x) + (2)$$

Example: Multiple Vertical Asymptotes

$$\frac{x-1}{(x+2)(x+3)}$$

$$(x) + (-1) \;\big|\; (0)$$