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

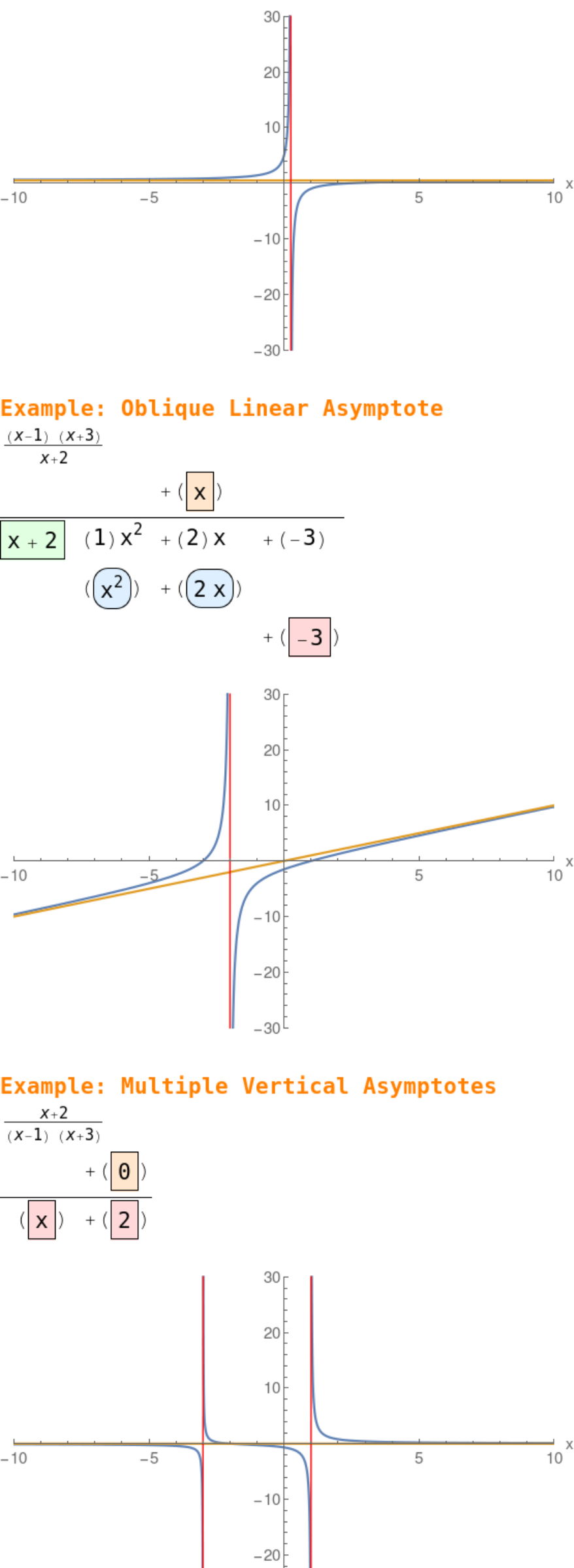
$$\frac{2x-5}{4x-1}$$

$$+\left(\frac{1}{2}\right)$$

$$4x-1 \quad (2)x \quad +(-5)$$

$$\left(2x\right) \quad +\left(-\frac{1}{2}\right)$$

$$+\left(-\frac{9}{2}\right)$$



Example: Oblique Linear Asymptote

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

$$+\left(x\right)$$

$$x+2 \quad (1)x^2 \quad +(2)x \quad +(-3)$$

$$\left(x^2\right) \quad +\left(2x\right)$$

$$+\left(-3\right)$$

Example: Multiple Vertical Asymptotes

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

$$+\left(0\right)$$

$$\left(x\right) \quad +\left(2\right)$$