37. $\frac{2}{3}, -1, 3+i\sqrt{2}, 3-i\sqrt{2}$

$3 \cdot x = \frac{2}{3}3 \quad x = -1 \quad x = 3+i\sqrt{2} \quad x = 3-i\sqrt{2}$

$3x = 2 \quad x+1=0 \quad x-3-i\sqrt{2}=0 \quad x-3+i\sqrt{2}=0$

$3x-2=0$

$(3x-2)(x+1)(x-3-i\sqrt{2})(x-3+i\sqrt{2})=0$

$[3x^2+3x-2x-2][x^2-3x+xi\sqrt{2}-3x+9-3i\sqrt{2}+2]$

$-xi\sqrt{2} \quad +3i\sqrt{2}$

$(3x^2+x-2)(x^2-6x+11)$

$3x^4-18x^3+33x^2+x^3-6x^2+11x$

$-2x^2+12x-22$

$3x^4-17x^3+25x^2+23x-22$

$$y = x^2 - 4$$

$$y = 2x^2 - 8$$

2.7 $f(x) = \frac{4}{x-3}$

$y = \frac{4}{x-3}$

$x \neq 3$

$x = 3$ Vertical Asymptote

Division by Zero

$f(x) = \frac{x^1}{x^2 - x - 2}$

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

$x - 2 = 0$ $\quad x + 1 = 0$

$x = 2$ $\quad x = -1$

Vertical Asymptotes

$$f(x) = \frac{a_n x^n + a_{n-1} x^{n-1} + \ldots a_1 x + a_0}{b_m x^m + \ldots + b_1 x + b_0}$$

$n < m$ x-axis horizontal asymptote

$n = m$ $y = \frac{a_n}{b_n}$ horizontal asymptote

$n > m$ no horizontal asymptote

n degree of numerator

m degree of denominator

$$f(x) = \frac{x^1 + 3}{x^2 + 5x + 6}$$

n: 1
m = 2

$n < m$
$1 < 2$

Horizontal Asymptote
x-axis

$$f(x) = \frac{(x+3)}{(x+2)(x+3)}$$

Vertical Asymptote.

$x = -2$

Hole $x = -3$

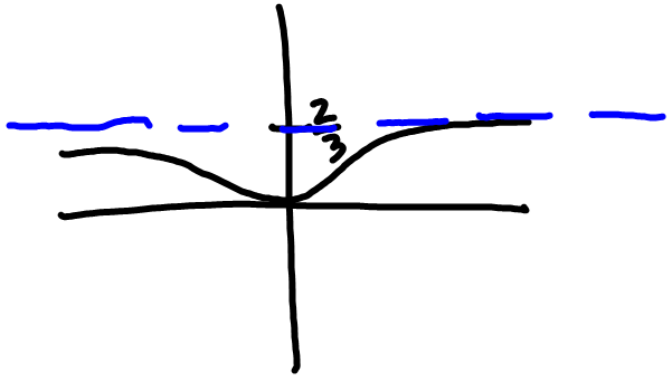
Common factor in numerator & denominator

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

$$y = \frac{2}{3}$$

$$f(x) = \frac{2x^2}{3x^2 + 1}$$

$$y = \frac{2}{3}$$



Slant Asymptote

degree of numerator is one more than the degree of the denominator

$$f(x) = \frac{x^2 - x}{x^1 + 1}$$

$$\begin{array}{r|rrr} -1 & 1 & -1 & 0 \\ & & -1 & 2 \\ \hline & 1 & -2 & 2 \\ & x & c & R \end{array}$$

$$x - 2 + \frac{2}{x+1}$$

$$y = x - 2$$