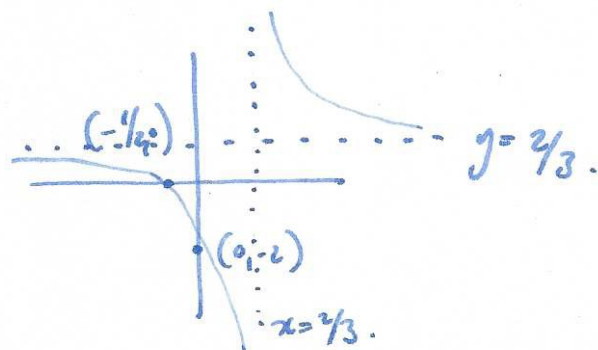


§ 3.7 Rational functions

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$$f(x) = \frac{p(x)}{q(x)} \text{ } \mathfrak{D} \text{ polynomials}$$



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

$f(0)$ = intersection with y-axis = $(0, -2)$ | solve $f(x) = 0$ for intersection w/ x-axis
 $2x+1 = 0 \quad x = -1/2$

vertical asymptote: solve $3x-2 = 0 \quad x = 2/3$

horizontal asymptote: look for ratio between biggest powers of x : $\frac{2x}{3x} = \frac{2}{3}$

check signs:

$2x+1$	-	+	+
$3x-2$	-	-	+
$f(x)$	+	-	+
	$-1/2$		$2/3$

Example $\frac{(3x-1)(x+2)}{(x-3)(x+1)} = \frac{3x^2+5x-2}{x^2-2x-3}$

y-intercept: $f(0) = \frac{(-1)(2)}{(-3)(1)} = \frac{2}{3}$

x-intercept: solve $f(x) = 0 \quad x = 1/3, x = -2$

vertical asymptotes: $x = 3, x = -1$

horizontal asymptotes: $y = 3$

signs:

$(3x-1)$	-	-	-	+	+
$(x+2)$	-	+	+	+	-
$(x-3)$	-	-	-	-	+
$(x+1)$	-	-	+	+	+
$f(x)$	+	-	+	-	+
	-2	-1	$1/3$	3	

