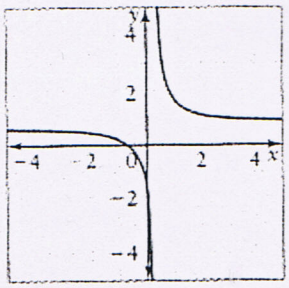
$f(x) = \frac{3x + 2}{4x - 1}$



For a rational function $f(x) = \frac{ax + b}{cx + d}$.

- the y-intercept is $\frac{b}{d}$
- the x-intercept is $-\frac{b}{a}$
- the vertical asymptote is $-\frac{d}{c}$
- the horizontal asymptote is $\frac{a}{c}$, where a and c are the leading coefficients of the binomials in the numerator and denominator, and the degree of each is the same

A rational function of the form $f(x) = \frac{ax + b}{cx + d}$ has the following key features:

- The equation of the vertical asymptote can be found by setting the denominator equal to zero and solving for x, provided the numerator does not have the same zero.
- The equation of the horizontal asymptote can be found by dividing each term in both the numerator and the denominator by x, and by investigating the behaviour of the function as $x \to \pm\infty$.
- The coefficient b acts to stretch the curve, but it has no effect on the asymptotes, domain, or range.
- The coefficient d shifts the vertical asymptote.
- The two branches of the graph of the function are equidistant from the point of intersection of the vertical and horizontal asymptotes.

For the function, $h(x) = \frac{2x+3}{4-3x}$ $= \frac{2x+3}{-3x+4}$

i) determine the equations of the asymptotes

VA: $x = -\frac{d}{c} = \frac{4}{3}$ H.A.: $h(x) = \frac{a}{c} = -\frac{2}{3}$

ii) state the domain and range

$D = \{x \mid x \neq \frac{4}{3}, x \in \mathbb{R}\}$

$R = \{h(x) \mid h(x) \neq -\frac{2}{3}, h(x) \in \mathbb{R}\}$

iii) summarize the increasing and decreasing intervals

Interval	x < x-intercept	x-intercept	x-intercept < x <	x >
sign of f(x)	−	−	No sign	−
sign of slope	+	+	+	+

Homework: pg 174; # 1 – 9, 11, 16, 17, 18
Handin: pg ~~167, #13~~ 175 #13