Questions from Homework?

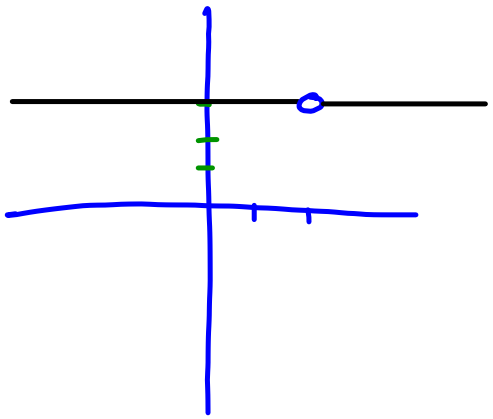
2gj
3ce

2g) $y = \frac{3x-6}{x-2} = \frac{3(x-2)}{x-2} = \frac{3}{1}$

when $x=2$, $y=3$

$y = \frac{0}{0}$

∴ hole at $x=2$



2j) $y = \frac{x+4}{x^2-16} = \frac{1}{x-4}$ $x \neq 4$

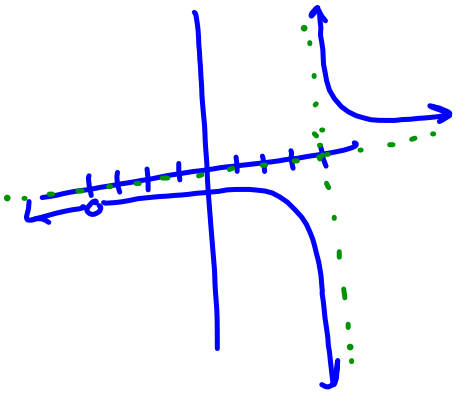
$= \frac{x+4}{(x+4)(x-4)}$

$x=-4$ $y = \frac{0}{0}$

∴ hole at $x=-4$

$x=4$ $y = \frac{8}{0}$

∴ VA at $x=4$



3c) $\frac{x+2}{(x+2)(x-1)}$ HA: 0

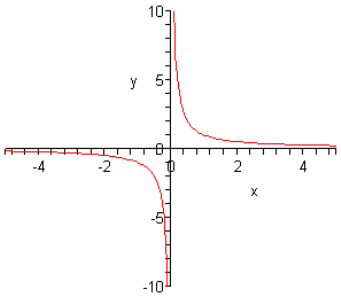
$= \frac{x+2}{x^2+x-2}$

3e) $\frac{x^3}{x^2+x+1}$

Lesson 5.03 - Graphs of Rational Functions of the Form $f(x)=\frac{ax+b}{cx+d}$

Learning Goals:

- I can graph and graph of the form above
- I can determine the end behaviours of the function
- I can determine the behaviours of the function around the asymptotes



To graph rational functions, it is not enough to know the asymptotes. We need to know what the function does around these asymptotes. To do this we will test what is happening around these areas and determine the end behaviours.

We will also determine the x and y intercepts and the end behaviours to create our graphs.

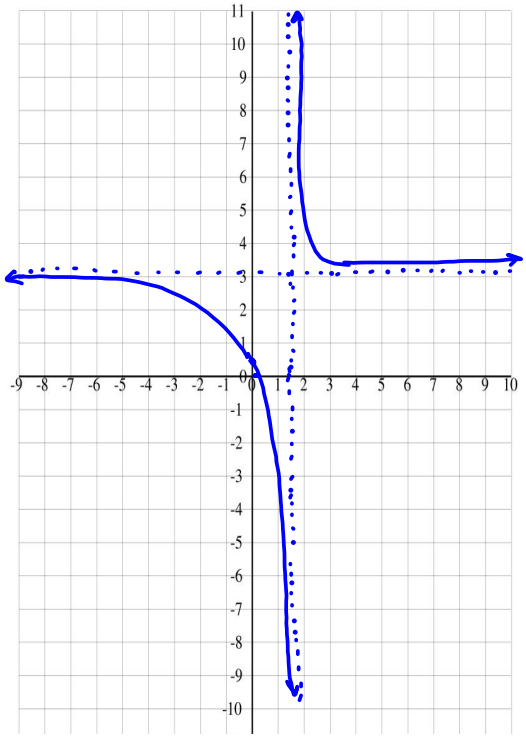
Example

Graph each of the following by finding the asymptotes and the behaviour around them, the intercepts, and the intervals in which the function is positive and negative.

$y = \frac{6x-1}{2x-3}$ Same degree

at $x = \frac{3}{2}$ $\therefore HA = \frac{6}{2}$

$\Rightarrow VA\ \frac{8}{0}$ $y = 3$



To find y-int, $x=0$

$y = \frac{-1}{-3}$

$= \frac{1}{3}$

To find x-int, $y=0$

$0 = \frac{6x-1}{2x-3}$

$\Rightarrow$ x-int $= \frac{1}{6}$

Lets see what happens

when $x \to \frac{3}{2}^-$ approaching from the left

$x = 1.4$

$y = \frac{6(1.4)-1}{2(1.4)-3}$

$= -37$

at $x = 1.499$

$y = \frac{6(1.499)-1}{2(1.499)-3}$

$= -3997$

as $x \to \frac{3}{2}^-$, $y \to -\infty$

as $x \to -\infty$, $y \to 3$

$y = \frac{6(-100)-1}{2(-100)-3}$

$\doteq 2.96$

$y = \frac{6(-100000)-1}{2(-100000)-3}$

$\doteq 3.00$

as $x \to \infty$, $y \to 3$

as $x \to \frac{3}{2}^+$, $y \to \infty$

$y = \frac{6(1.50001)-1}{2(1.50001)-3}$

$= 400003$

Example

Graph each of the following by finding the asymptotes and the behaviour around them, the intercepts, and the intervals in which the function is positive and negative.

$$y = \frac{2x+3}{x+5}$$

VA → $x = -5$

HA → $y = 2$

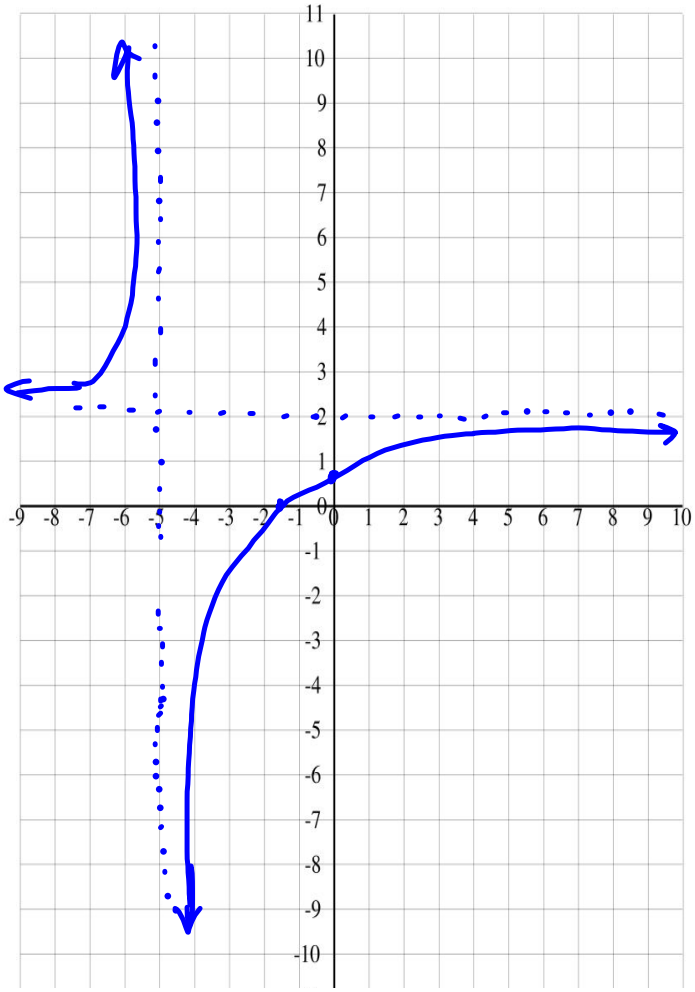
y-int: $\frac{3}{5}$ x-int: $-\frac{3}{2}$

as $x \to \infty$, $y \to 2$

as $x \to -\infty$, $y \to 2$

as $x \to -5^-$, $y \to +\infty$

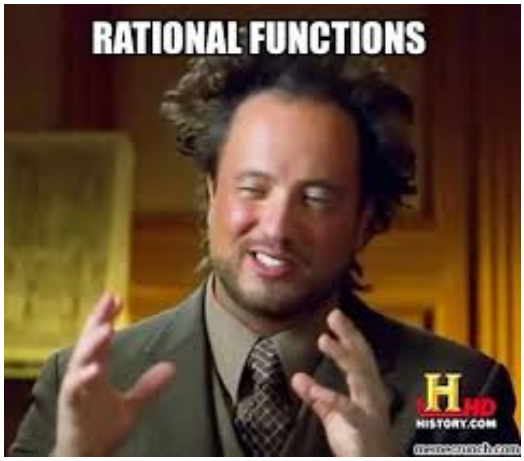
as $x \to -5^+$, $y \to -\infty$



Homework:

pg. 272 #1, 5ad, 6, 8[1], 9, 10[2]

Challenge: 12, 13, 14[3]



Corrections

1 - f(x)has VA at x=1 and HA at y=3; g(x) has a HA at y=0.5 and VA at x=-1.5

2 - The concentration increase of the 24hr period and approaches approximately 1.85 mg/L

3- a) f(x) and m(x) b) g(x)