PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES – WEEK 10

School: Penang Sangam High School **Year/Level:** 13 **Subject:** Mathematics

Strand	3 **FUNCTIONS**
Sub Strand	3.2.2 Graphs of Rational Functions (Top Heavy Functions)
Content Learning Outcome	Students should be able to; - find x and the y intercept - find vertical asymptote and oblique asymptote. - sketch the graph

Top Heavy Functions

- The degree of the numerator is larger than the denominator.

- It has Oblique Asymptote. (Calculated by carrying out long division)

Steps to sketch the graph

- Find x- intercept (numerator = 0)

- Find y – intercept (let $x = 0$)

- find vertical asymptote and oblique asymptote

- Sketch the graph.

Example: Sketch the graph of $y = \frac{x^2-x}{x+1}$.

Find x – intercept and y – intercept.

x –int (num = 0)

$x^2 - x = 0$

$x(x-1) = 0$

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

$(0,0) \qquad x = 1 \quad (1,0)$

y- intercept (x = 0)

$$y = \frac{0^2 - 0}{0 + 1}$$

= 0 (0,0)

VA (let denominator equals 0)

$x + 1 = 0$

$x = -1$

To find **Oblique Asymptote,** carry out long division.

$$x+1\overline{)\,x^2-x}\;\;x-2$$

$$-(x^2+x)$$

$$-2x+0$$

$$-(-2x-2)$$

$$2$$

$y = x-2$

$x\ int\ (y=0)$

$0 = x-2$

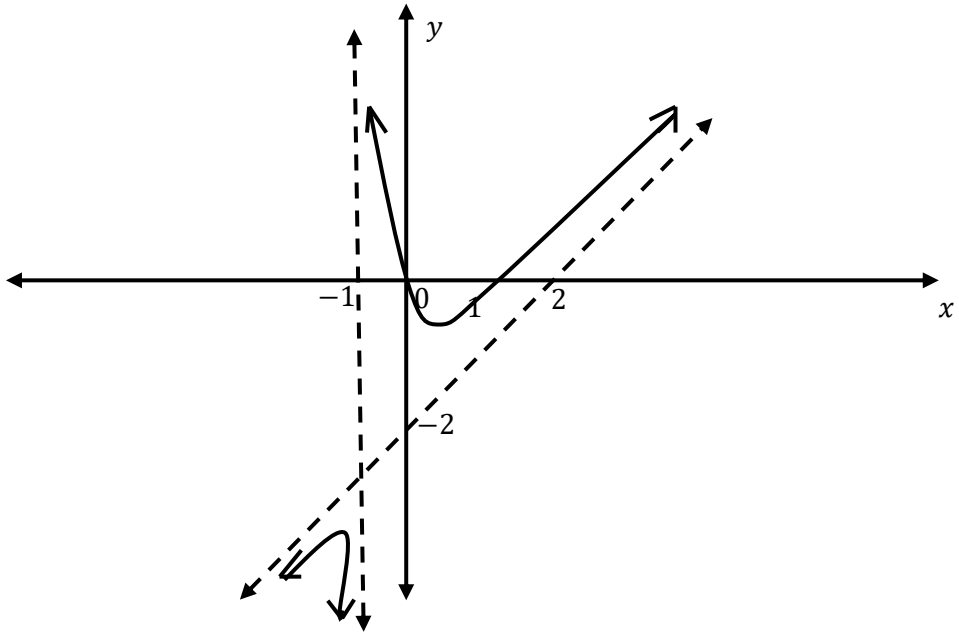
$x = \ 2\ (2, 0)$

$y\ int\ let\ x=0$

$y = x-2$

$y = 0-2$

$y = -2\ \ (0, -2)$



Exercise:

Sketch the following graphs

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

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