

YEAR 13 MATHEMATICS WEEKLY HOME PACKAGE 2 SOLUTION

A rational function is given by $f(x) = \frac{(x-6)}{(x-2)(x+3)}$.

(a) Find the x and y **intercepts** of $f(x)$.

(1 mark)

$x\text{-int} \rightarrow \text{let } y = 0 : x - 6 = 0$	$y\text{-int} \rightarrow \text{let } x = 0 : f(x) = \frac{(0-6)}{(0-2)(0+3)}$
<u>$x\text{-intercept} = (6, 0)$</u>	<u>$y\text{-intercept} = (0, 1)$</u>
($\frac{1}{2}$ mark)	($\frac{1}{2}$ mark)

(b) State the equations of the **asymptotes** of $f(x)$.

(1½ marks)

Vertical Asymptote: let denominator = 0	Horizontal Asymptote
$x - 2 = 0$ or $x = 2$	For all bottom heavy functions the x -axis ($y = 0$) is the horizontal asymptote.
$x + 3 = 0$ or $x = -3$	$y = 0$
(1 mark)	(½ mark)

(c) Hence, sketch the **graph** of the function $f(x)$.

(3½ marks)

