



## H2 Mathematics (9758)

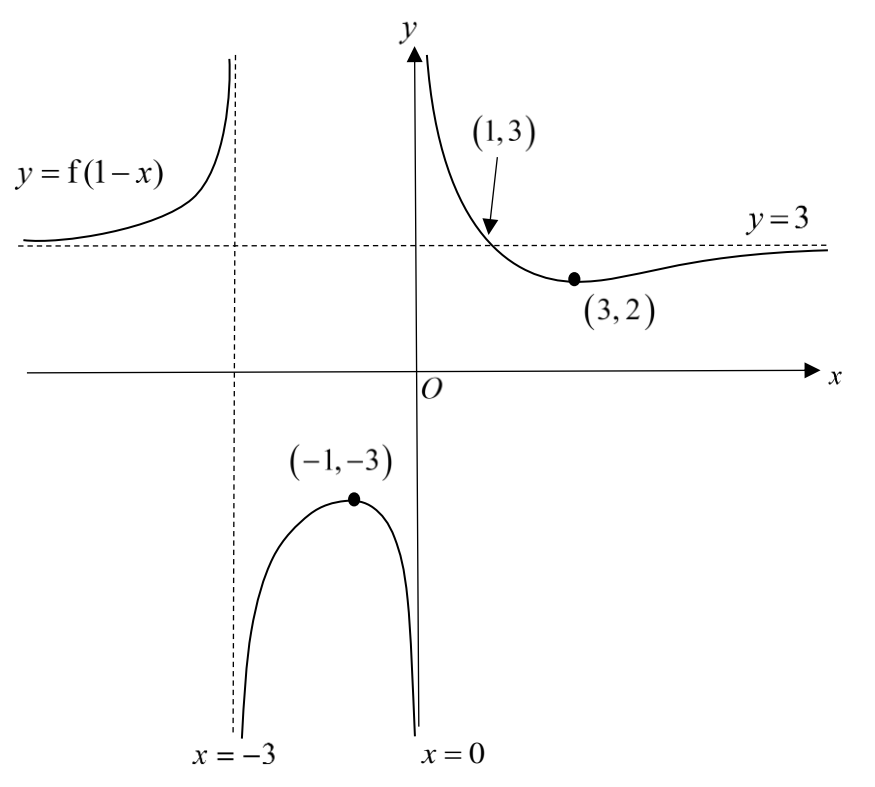
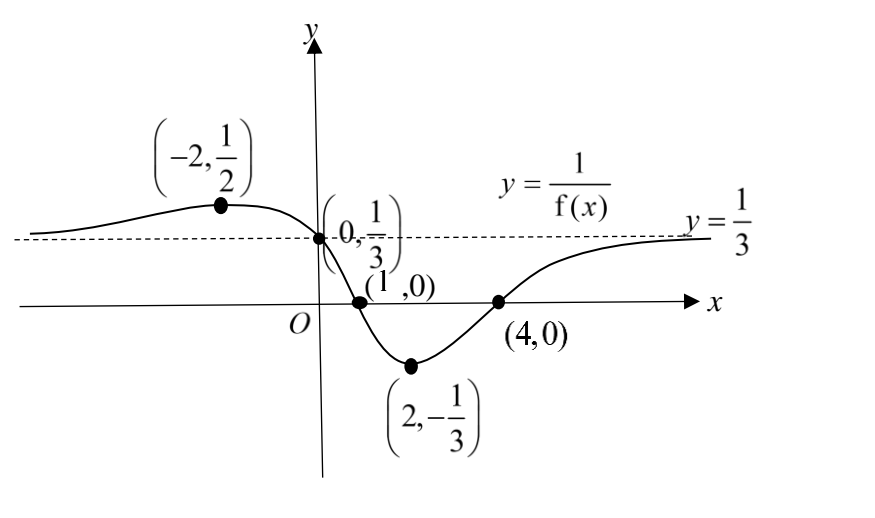
### Chapter 2 Transformation of Curves

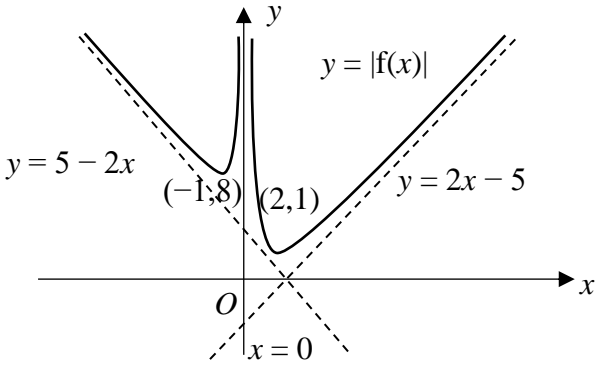
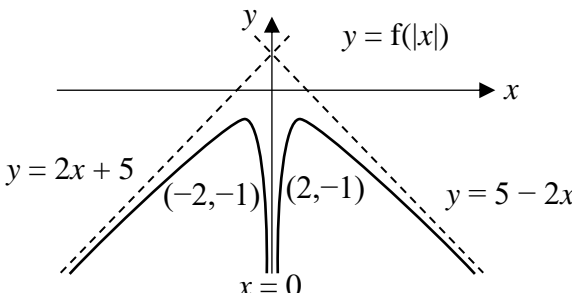
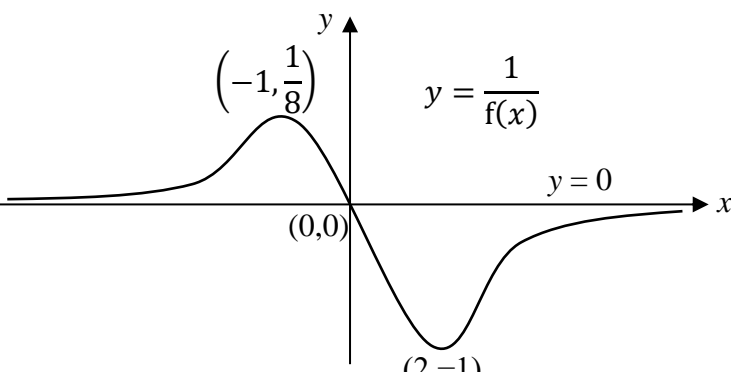
### Extra Practice Solutions

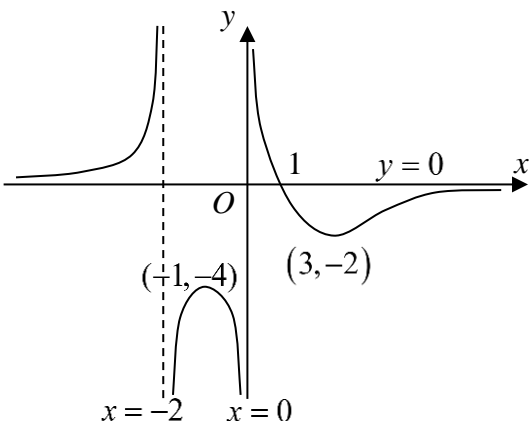
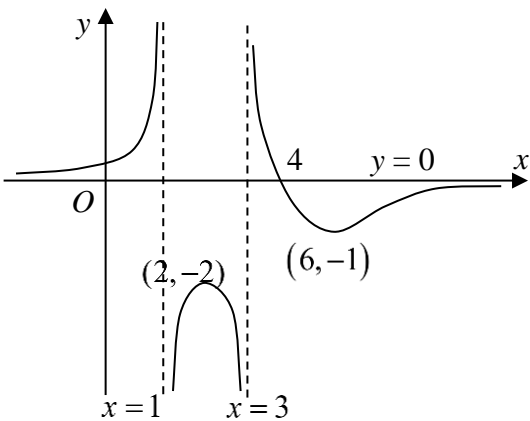
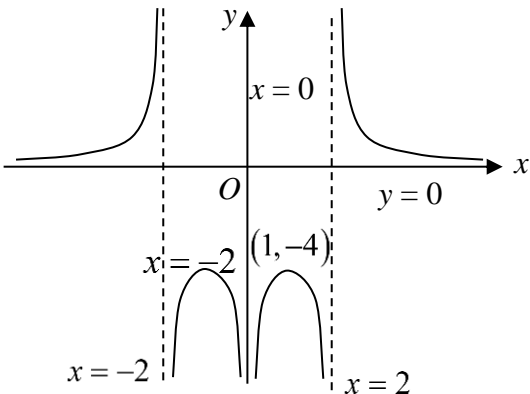
Qn 1	2020/VJC/8b
	<p>Before C, the equation of curve is <math>y = -\frac{x+3}{x+2}</math></p> <p>Before B, the equation is <math>y = \frac{x+3}{x+2}</math></p> <p>Before A, the equation is <math>y = \frac{(x-3)+3}{(x-3)+2} = \frac{x}{x-1}</math></p> <p><math>\therefore y = \frac{x}{x-1}</math></p>

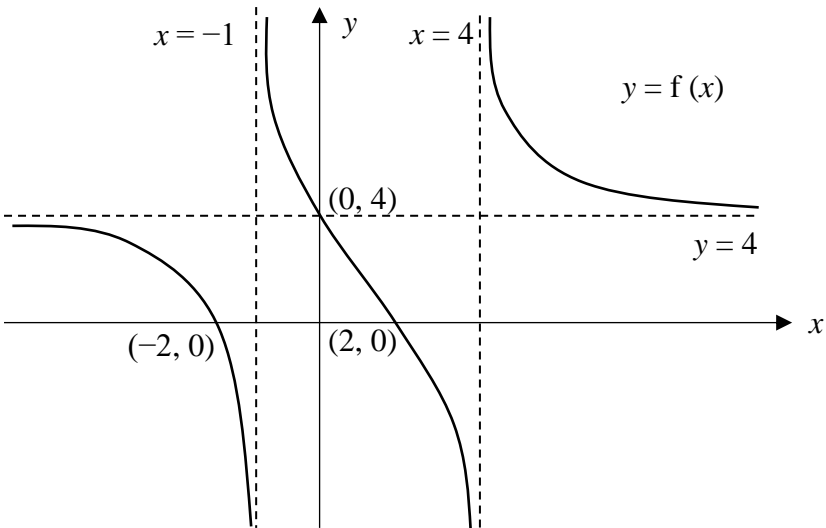
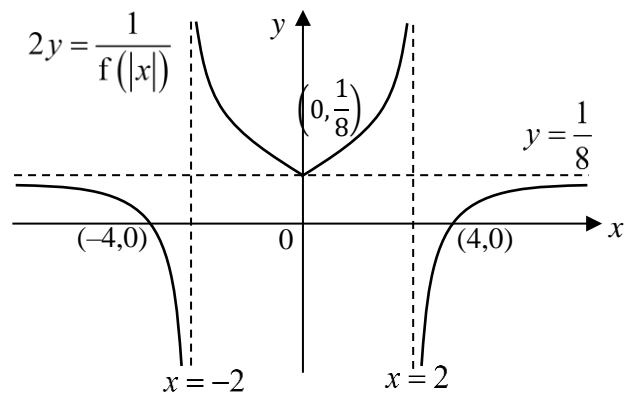
Qn 2	2020/CJC Prelim/1
(i)	$f(x) = \frac{2x+3}{3x+5}$ $= \frac{2}{3} - \frac{1}{3(3x+5)}$ $= \frac{2}{3} + \frac{-\frac{1}{3}}{3x+5}$
(ii)	<p><math>y = \frac{1}{x} \rightarrow y = \frac{1}{9} \left( \frac{1}{x} \right) = \frac{1}{9x}</math></p> <p><b>Step1:</b> stretching by a factor of <math>\frac{1}{9}</math> parallel to the <math>y</math>-axis</p> <p>Or stretching by a factor of <math>\frac{1}{9}</math> parallel to the <math>x</math>-axis</p> $y = \frac{1}{9x} \rightarrow y = \frac{1}{9\left(x + \frac{5}{3}\right)}$ <p><b>Step2:</b> translation by <math>\frac{5}{3}</math> units in the negative <math>x</math>-direction</p> $y = \frac{1}{9\left(x + \frac{5}{3}\right)} \rightarrow y = -\frac{1}{9\left(x + \frac{5}{3}\right)}$ <p><b>Step3:</b> reflection in the <math>x</math>-axis</p>

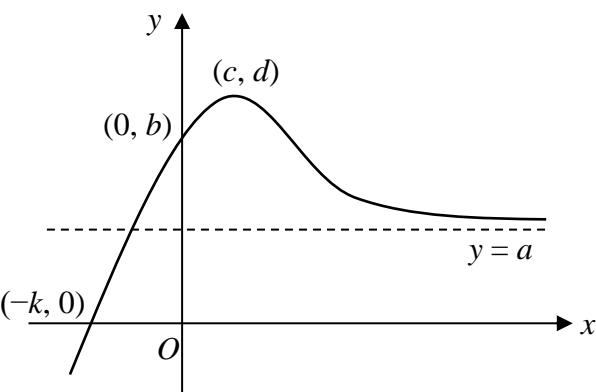
	$y = -\frac{1}{9\left(x + \frac{5}{3}\right)} \rightarrow y = \frac{2}{3} - \frac{1}{9\left(x + \frac{5}{3}\right)}$ <p><b>Step4:</b> translation by <math>\frac{2}{3}</math> units in the positive y-direction</p>
--	---

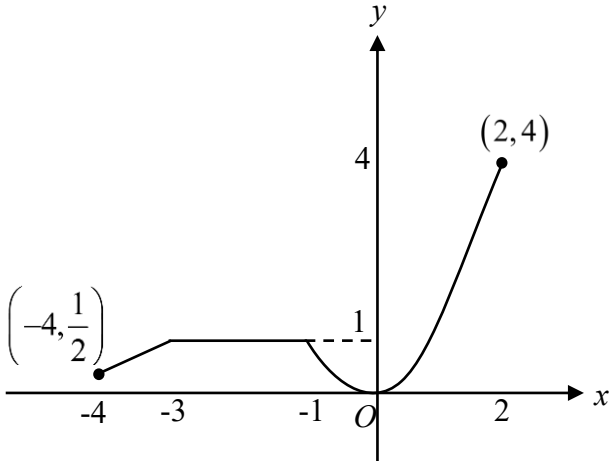
Qn 3	2020/RI Prelim/6
(a)	 <p>The graph shows two curves, <math>y = f(1-x)</math> and <math>y = f(x)</math>, plotted on a Cartesian coordinate system. The curve <math>y = f(1-x)</math> is on the left, with a vertical asymptote at <math>x = -3</math> and a horizontal asymptote at <math>y = 3</math>. The curve <math>y = f(x)</math> is on the right, with a vertical asymptote at <math>x = 0</math> and a horizontal asymptote at <math>y = 3</math>. Key points are labeled: <math>(1, 3)</math> and <math>(3, 2)</math> on <math>y = f(x)</math>, and <math>(-1, -3)</math> on <math>y = f(1-x)</math>. The origin is labeled <math>O</math>.</p>
(b)	 <p>The graph shows two curves, <math>y = \frac{1}{f(x)}</math> and <math>y = \frac{1}{f(1-x)}</math>, plotted on a Cartesian coordinate system. The curve <math>y = \frac{1}{f(x)}</math> is on the right, with a vertical asymptote at <math>x = 1</math> and a horizontal asymptote at <math>y = \frac{1}{3}</math>. The curve <math>y = \frac{1}{f(1-x)}</math> is on the left, with a vertical asymptote at <math>x = -1</math> and a horizontal asymptote at <math>y = \frac{1}{3}</math>. Key points are labeled: <math>(-2, \frac{1}{2})</math>, <math>(0, \frac{1}{3})</math>, <math>(1, 0)</math>, <math>(2, -\frac{1}{3})</math>, and <math>(4, 0)</math> on <math>y = \frac{1}{f(x)}</math>, and <math>(-2, \frac{1}{2})</math> on <math>y = \frac{1}{f(1-x)}</math>. The origin is labeled <math>O</math>.</p>

Qn 4	2017/MI Promo/10 (modified)
(i)	 <p>Graph of <math>y =  f(x) </math> showing a V-shape with a vertical asymptote at <math>x = 0</math>. The left branch passes through <math>(-1, 8)</math> and the right branch passes through <math>(2, 1)</math>. Dashed lines <math>y = 5 - 2x</math> and <math>y = 2x - 5</math> are shown. The origin is labeled <math>O</math>.</p>
(ii)	 <p>Graph of <math>y = f( x )</math> showing a symmetric V-shape with a vertical asymptote at <math>x = 0</math>. The left branch passes through <math>(-2, -1)</math> and the right branch passes through <math>(2, -1)</math>. Dashed lines <math>y = 2x + 5</math> and <math>y = 5 - 2x</math> are shown. The x-axis is labeled <math>x</math> and the y-axis is labeled <math>y</math>.</p>
(iii)	 <p>Graph of <math>y = \frac{1}{f(x)}</math> showing a curve with a vertical asymptote at <math>x = 0</math>. The curve passes through <math>(-1, \frac{1}{8})</math>, <math>(0, 0)</math>, and <math>(2, -1)</math>. The x-axis is labeled <math>x</math> and the y-axis is labeled <math>y</math>.</p>

Qn 5	2012/VJC Prelim/I/9(b) (modified)
(i)	<p><math>y = h(x+3)</math></p> 
(ii)	<p><math>y = \frac{1}{2}h(x)</math></p> 
(iii)	<p><math>y = h(- x +3)</math></p>  <div data-bbox="900 1361 1382 1491" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Just replace <math>x</math> by <math> x </math> using original graph of <math>y = h(3-x)</math>.</p> </div>

Qn 6	2017/RVHS Promo/6
<p>(a) (i)</p>	
<p>(a) (ii)</p>	 <p><b>Note:</b> <math>\left(0, \frac{1}{8}\right)</math> is a sharp point.</p>

Qn 7	2018/MI Promo/2
	

Qn 8	2021/Y1JC Prelim/2
(i)	
(ii)	