

removable discontinuity

IB Pre HL

Graphing Rational Functions

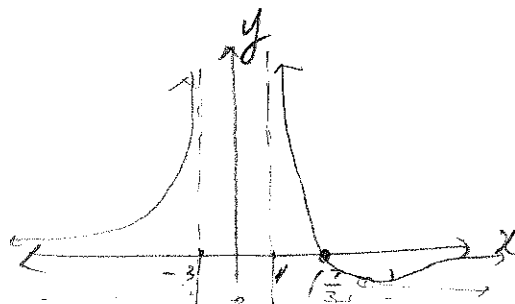
State the horizontal asymptote, vertical asymptote(s), hole(s), x-intercept(s), and y-intercept. And then sketch the graph showing all these elements.

Name: key
 Period: _____

a. $y = \frac{7-3x}{2x^2+x-3} = \frac{-(3x-7)}{(2x+3)(x-1)}$

$2x^2$	$+x-3$
$2x$	$+3$
x	-1

holes(s): None
 H.A: $y = 0$
 V.A: $x = 1$ $x = -\frac{3}{2}$
 x-int: $x = \frac{7}{3}$ $(\frac{7}{3}, 0)$
 y-int: $(0, -\frac{7}{3})$

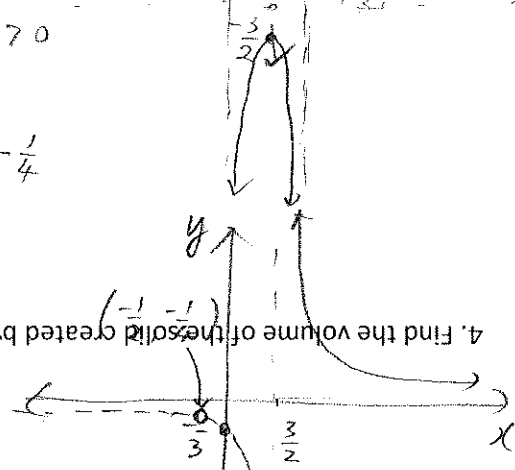


b. $y = \frac{2x+1}{4x^2-4x-3} = \frac{2x+1}{(2x+1)(2x-3)}$

$2x$	$+1$
$2x$	-3

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

$x = -5$ $y = \frac{7+15}{2(25)-5-3} > 0$
 Hole: $x = -\frac{1}{2}$ $y = -\frac{1}{4}$
 $(-\frac{1}{2}, -\frac{1}{4})$



4. Find the volume of the solid created by revolving the region around the y-axis using the Theorem of Pappus.

c. $y = \frac{x^2+3x-4}{2x^2+7x-4} = \frac{(x+4)(x-1)}{(2x-1)(x+4)}$

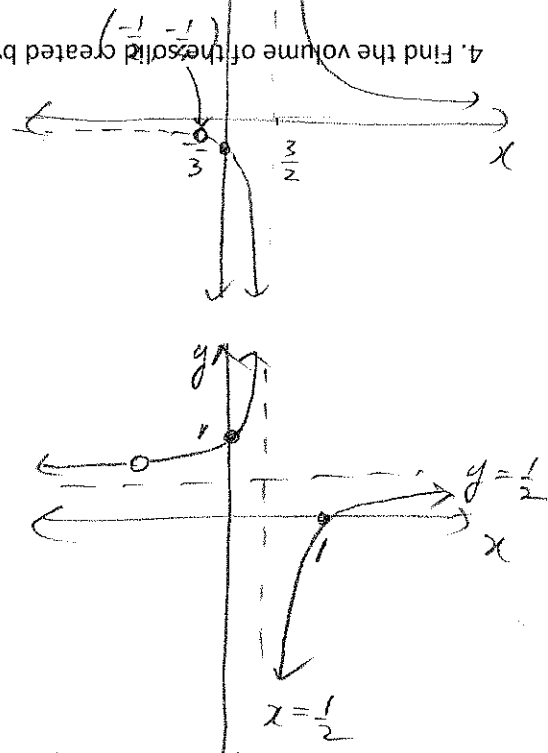
$2x^2$	$+7x-4$
$2x$	-1
x	$+4$

$= \frac{x-1}{2x-1}$

$\frac{-5}{-9}$

x^2+3x-4
$x+4$
$x-1$

H.A: $y = 0$
 V.A: $y = \frac{3}{2}$
 x-int: None
 y-int: $(0, \frac{1}{3})$
 Hole: $(-4, \frac{5}{9})$
 H.A: $y = \frac{1}{2}$
 V.A: $x = \frac{1}{2}$
 x-int: $(1, 0)$
 y-int: $(0, 1)$



3. Find the centroid (center of mass) of the region.

Practice WS:

Without a calculator, sketch a complete graph of each function including the vertical and horizontal asymptotes, holes, x-intercepts, y-intercept and end behaviour. Check your answers on your graphing calculator.

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

2. $f(x) = \frac{x}{x^2+2x}$

3. $f(x) = \frac{2x^2-5x-3}{x^2-2x-3}$

4. $f(x) = \frac{2x^2-6x+4}{x^3-2x^2-1}$

5. $f(x) = \frac{4x^2-9}{x^2-4x+3}$

2. [4 pts] Find the area of the region enclosed by the graph of $f(x) = \frac{2x^2-5x-3}{x^2-2x-3}$ and the x-axis between $x = -1$ and $x = 3$.