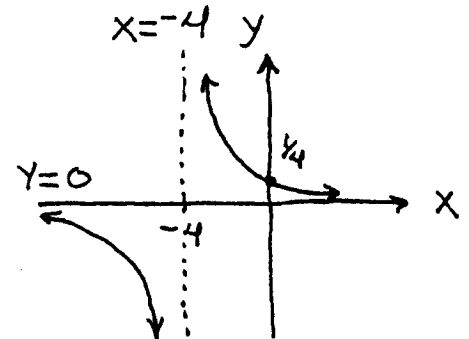


Section 4.7

2) $y = \frac{(x+6)(x+4)}{(x-1)^2}$; Domain: all $x \neq 1$,
 $x=0: y = \frac{24}{1} = 24$; $y=0: (x+6)(x+4)=0 \rightarrow x=-6, x=-4$

9) $y = \frac{1}{x+4}$
 $x=0: y = \frac{1}{4}$; $y=0: \text{impossible}$;
 Domain: all $x \neq -4$

x	-3	4	-5	-10
y	1	$\frac{1}{8}$	-1	$-\frac{1}{6}$



asymptotes: $x = -4$ and $y = 0$

$$16) y = \frac{2x}{x+3}$$

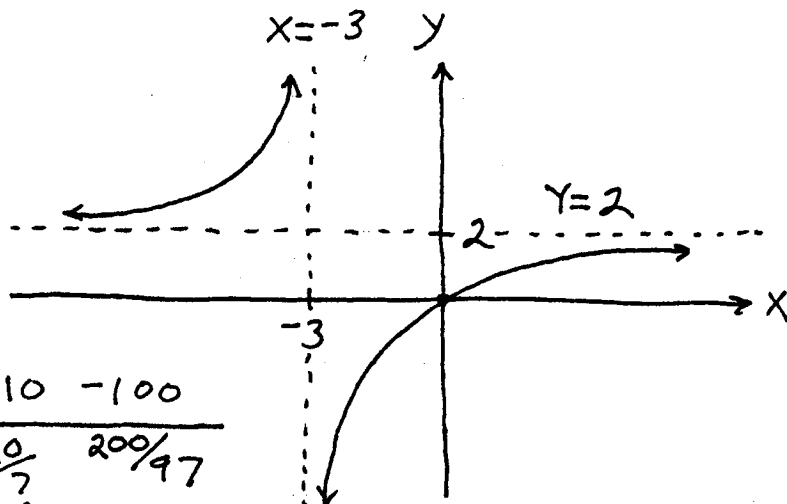
$$x=0 : y=0 ;$$

$$y=0 : 2x=0 \rightarrow x=0 ;$$

Domain : all $x \neq -3$

x	1	10	100	-2	-4	-10	-100
y	$\frac{1}{2}$	$\frac{20}{23}$	$\frac{200}{103}$	-4	8	$\frac{20}{7}$	$\frac{200}{97}$

asymptotes : $x = -3$ and $y = 2$



$$19) y = \frac{1}{(x-2)^2}$$

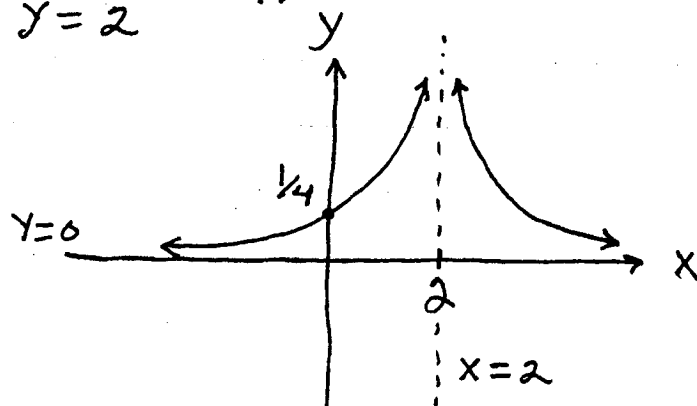
$$x=0 : y = \frac{1}{4} ;$$

$y=0$: impossible ;

Domain : all $x \neq 2$

x	1	-10	3	10	22
y	1	$\frac{1}{44}$	1	$\frac{1}{64}$	$\frac{1}{400}$

asymptotes : $x = 2$ and $y = 0$



$$26) y = \frac{x}{(x+1)(x-3)}$$

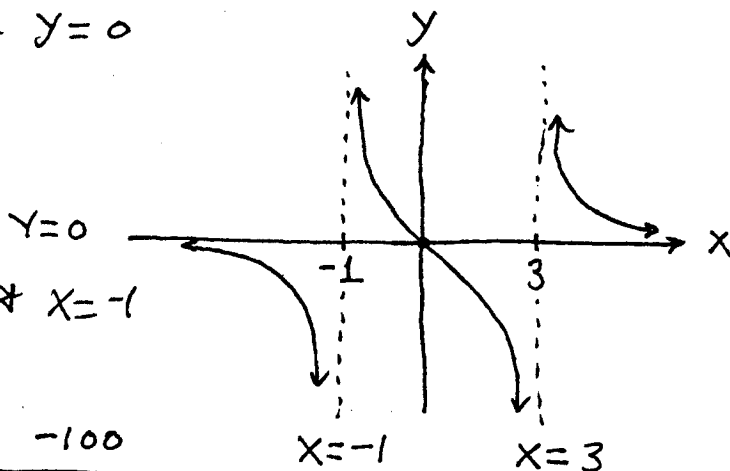
$$x=0 : y=0 ;$$

$$y=0 : x=0 ;$$

Domain : all x except $x = -1$
and $x = 3$

x	$-\frac{1}{2}$	2	4	100	-2	-100
y	$\frac{2}{7}$	$-\frac{2}{3}$	$\frac{4}{5}$	$\frac{100}{9797}$	$-\frac{2}{5}$	$-\frac{100}{10197}$

asymptotes : $x = -1$, $x = 3$, and $y = 0$

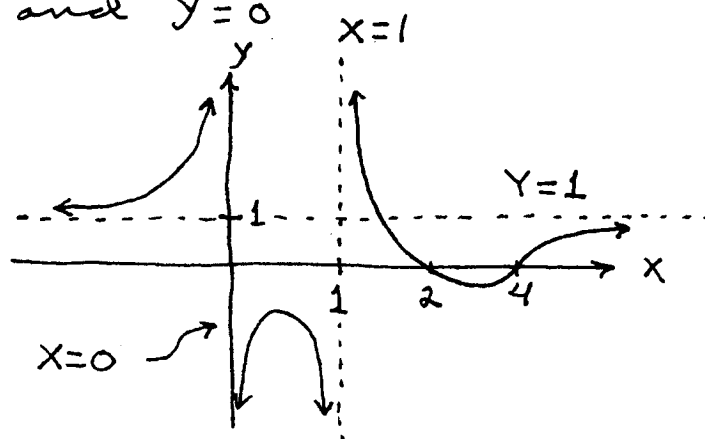


$$33) a.) f(x) = \frac{(x-2)(x-4)}{x(x-1)}$$

$x=0$: impossible ;

$$y=0 : (x-2)(x-4)=0 \rightarrow$$

$$x=2, x=4$$



Domain: all x except $x=0, x=1$;

x	1.1	3	10	100	0.5	0.9	0.1	-0.1	-100
y	23.7	$-\frac{1}{6}$	0.53	0.95	-21	-37.9	-82.3	78.3	1.05

asymptotes: $x=0, x=1$, and $y=1$

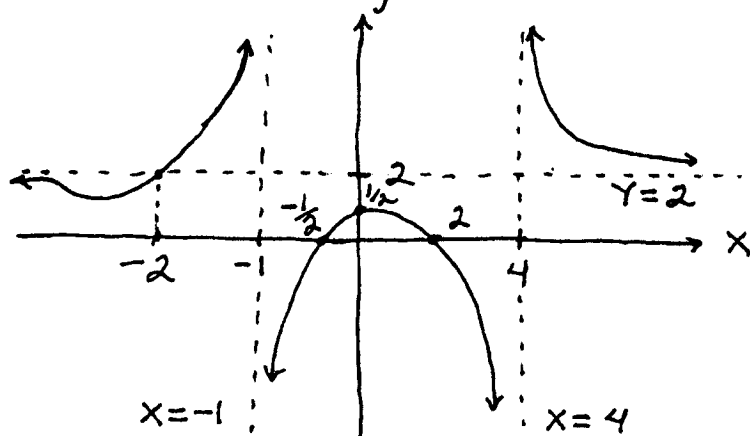
$$42) \quad y = \frac{2x^2 - 3x - 2}{x^2 - 3x - 4} = \frac{(2x+1)(x-2)}{(x-4)(x+1)}$$

$$x=0: y = \frac{1}{2};$$

$$y=0: (2x+1)(x-2)=0$$

$$\rightarrow x = -\frac{1}{2}, x=2;$$

Domain: all x
except $x=4, x=-1$



x	3.9	-0.9	4.1	100	-1.1	-100
y	-34.1	-4.7	37.9	2.03	7.3	1.97

asymptotes: $x=-1, x=4$, and $y=2$;

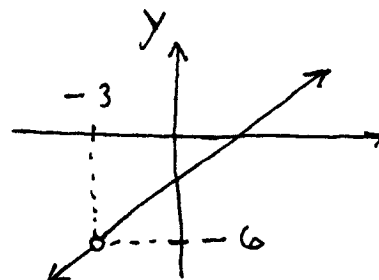
$$y=2 \rightarrow \frac{2x^2 - 3x - 2}{x^2 - 3x - 4} = 2 \rightarrow 2x^2 - 3x - 2 = 2x^2 - 6x - 8 \rightarrow 3x = -6 \rightarrow x = -2$$

$$44) \quad a.) \quad y = \frac{x^2 - 9}{x + 3}; \quad \text{Domain: all } x \neq -3$$

$$y = \frac{(x-3)(x+3)}{x+3} \rightarrow$$

$$y = x - 3 \quad (\text{and } x \neq -3)$$

so line with a
hole in it



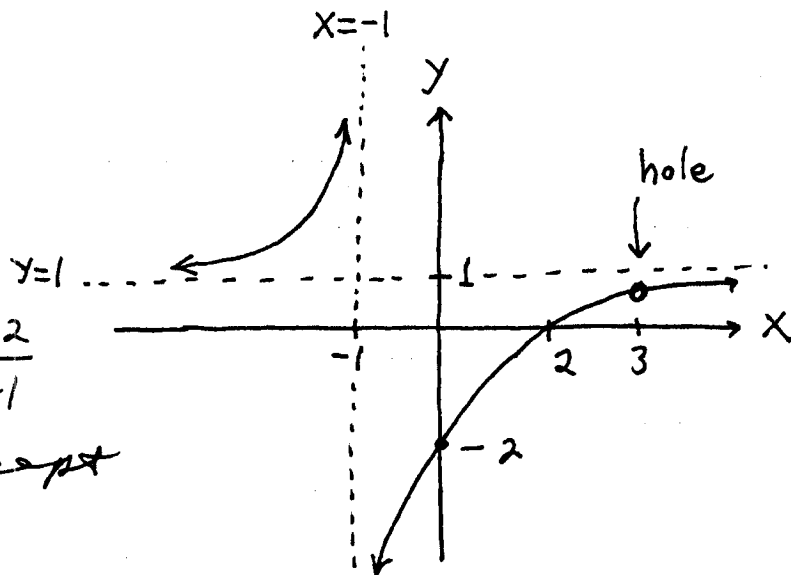
$$b.) y = \frac{x^2 - 5x + 6}{x^2 - 2x - 3}$$

$$= \frac{(x-3)(x-2)}{(x-3)(x+1)} = \frac{x-2}{x+1}$$

(Domain: all x except
 $x=3, x=-1$)

$$x=0: y=-2; \quad y=0: x=2$$

x	$-\frac{1}{2}$	-2	-100	100
y	-5	4	$34/33$	$98/101$



49) a.)

$$\begin{array}{r} x+4 \\ x-3 \overline{) x^2+x-6} \\ \underline{x^2-3x} \\ 4x-6 \\ \underline{4x-12} \\ 6 \end{array}$$

$$\text{so } x^2+x-6 = (x+4) + \frac{6}{x-3}$$

Thus $y = x+4$ is a slant asymptote.

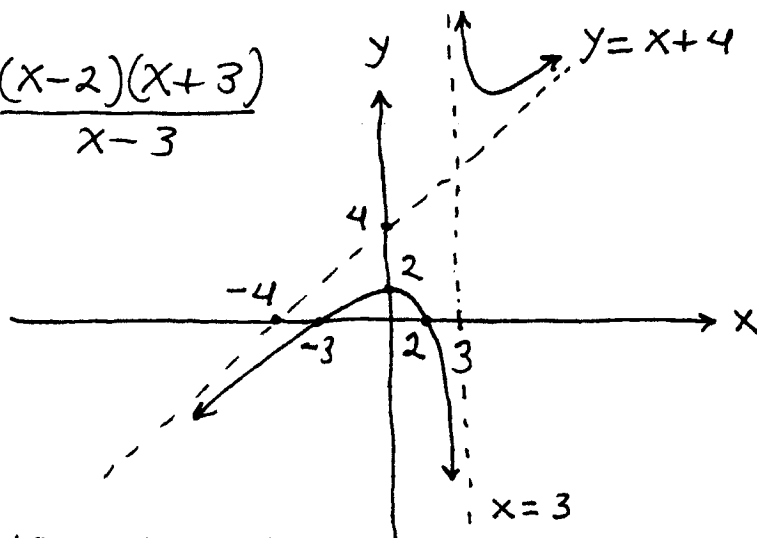
$$c.) F(x) = \frac{x^2+x-6}{x-3} = \frac{(x-2)(x+3)}{x-3}$$

$$x=0: y=2;$$

$$y=0: x=2, x=-3;$$

Domain: all $x \neq 3$

asymptote: $x=3$



d.)

x	2.9	3.1	-10	-100	10	100
$F(x)$	-53.1	67.1	-6.5	-96.1	14.9	104.1
$x+4$			-6	-96	14	104

50) a.) $F(x) = \frac{x^2}{x+2}$,
$$\begin{array}{r} x-2 \\ x+2 \overline{) x^2} \\ \underline{x^2 + 2x} \\ -2x \\ \underline{-2x - 4} \\ 4 \end{array}$$

so $\frac{x^2}{x+2} = (x-2) + \frac{4}{x+2}$

and $y = x-2$ is a slant asymptote.

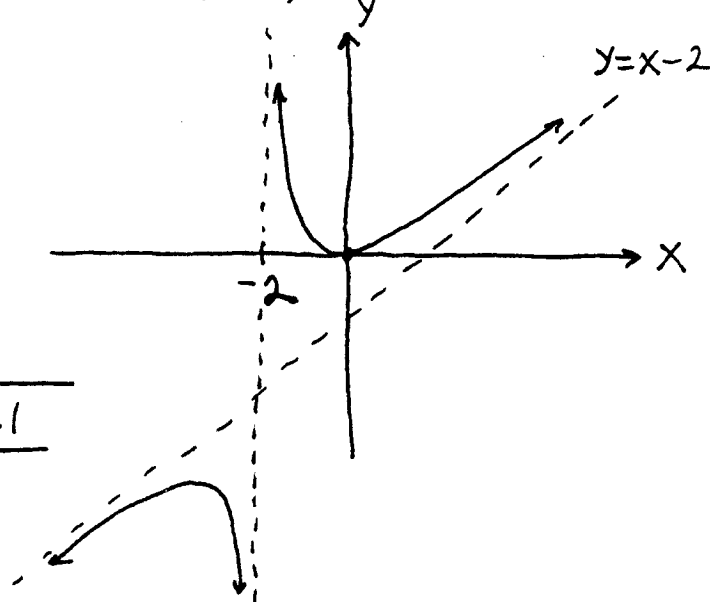
b.) $x=0: y=0$;

$y=0: x=0$;

Domain: all $x \neq -2$

asymptote: $x = -2$

X	-1.9	-2.1	10	100	-10	-100
F(x)	36.1	-44.1	-8.3	98.1	-12.5	-102.1
	$x-2$		8	98	-12	-102



51) $y = \frac{1-x^2}{x} = \frac{1}{x} - \frac{x^2}{x} = \frac{1}{x} - x \rightarrow$

$y = (-x) + \frac{1}{x}$ so $y = -x$ is a slant asymptote.