

① No denominator So no asymptotes

$$x^3 + 7x^2 + 10x = 0$$

$$x(x+5)(x+2) = 0$$

$$x=0 \quad x_2=-5 \quad x=-2$$

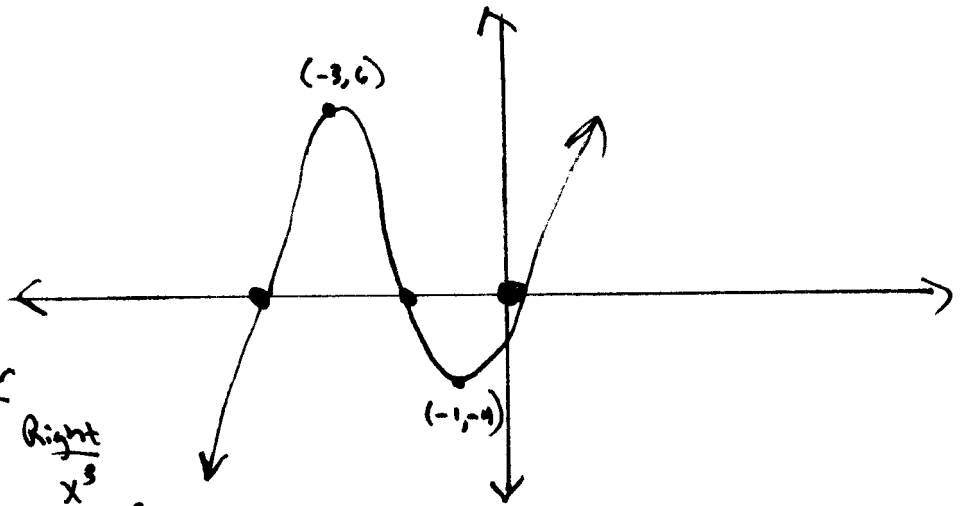
Roots ↑

Intermediate Tests

x	y
-3	6
-1	-4

End Behavior

<u>Left</u>	<u>Right</u>
x^3	x^3
$(-100)^3$	$(100)^3$
-∞	+∞



③ $f(x) = \frac{2}{(x+4)^2} \rightarrow \frac{2}{x^2+8x+16}$

Vertical Asymptote

$$\sqrt{(x+4)^2} = \sqrt{0}$$

$$x+4 = \pm 0$$

$$x = -4 \pm 0$$

$$x = -4$$

Horizontal Asymptote

$$\frac{2}{x^2}$$

HA @ 0

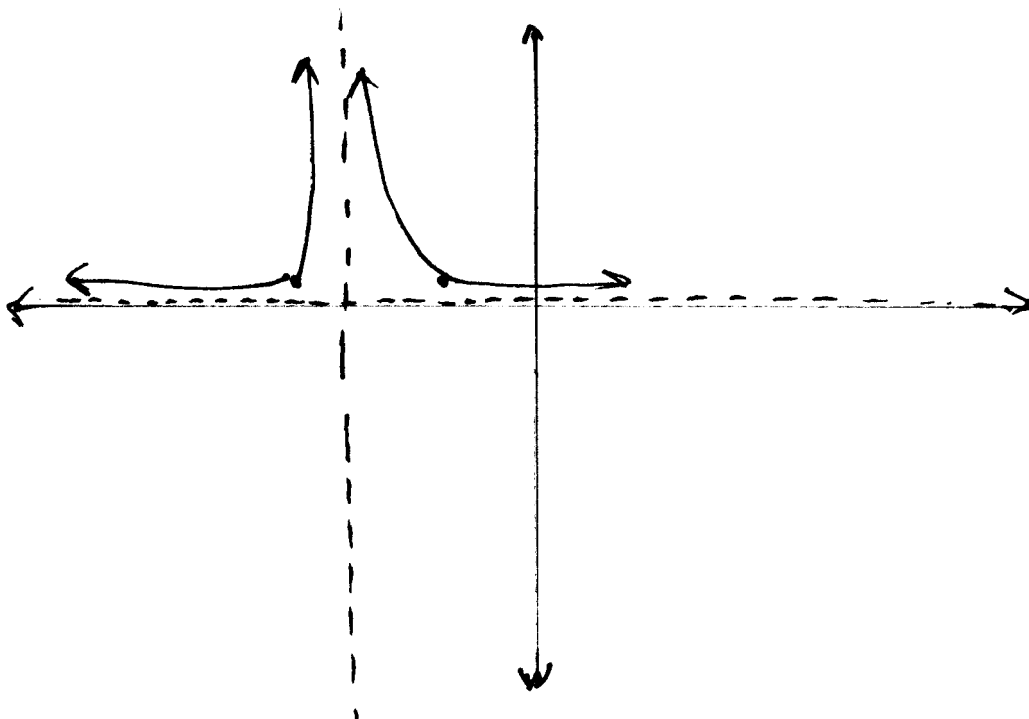
Roots

$$2 \neq 0$$

No Roots

Intermediate

x	y
-5	$\frac{2}{18} = .11$
-2	.5



5) $f(x) = \frac{x^2 - 10x + 25}{x^2 - 4x - 12}$

VA
 $x^2 - 4x - 12 \neq 0$
 $(x-6)(x+2) \neq 0$
 $x \neq 6 \quad x \neq -2$

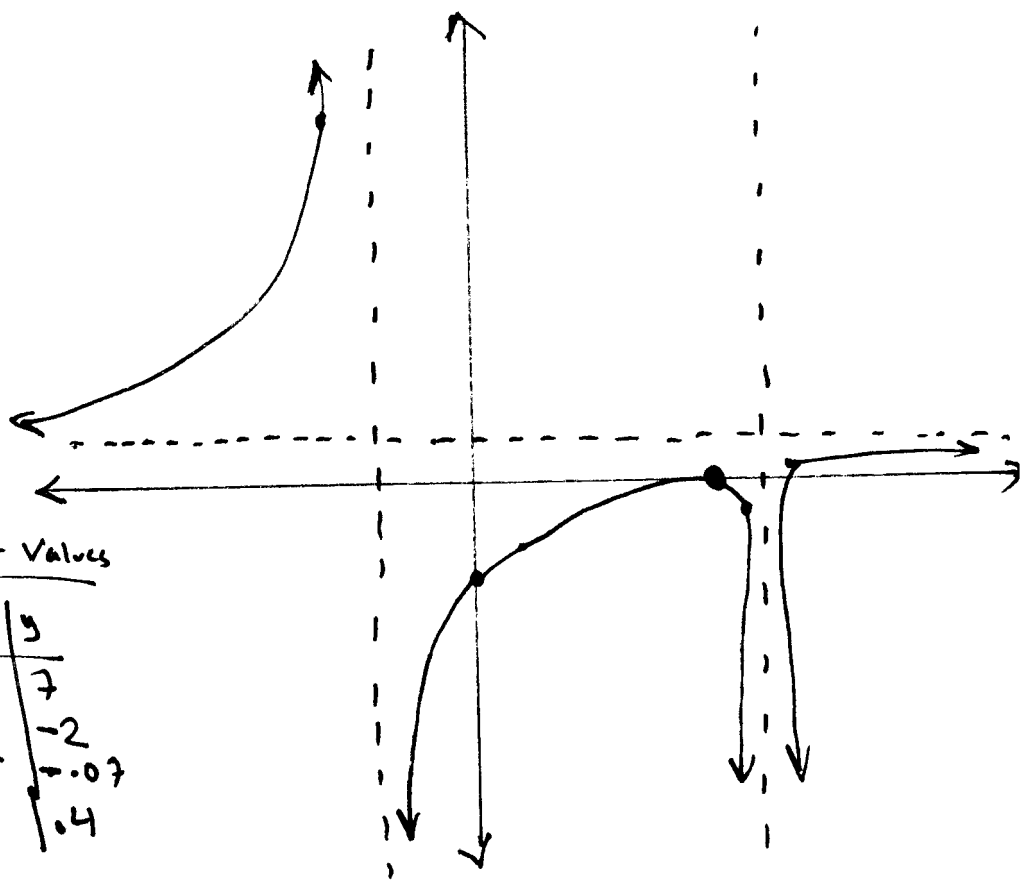
HA
 $\frac{x^2}{x^2}$
 HA @ 1

Roots

$x^2 - 10x + 25 = 0$
 $(x-5)(x-5) = 0$
 $x = 5$

Int Values

x	y
-3	7
0	-2
5.5	-0.07
7	0.4



7) $f(x) = \frac{x^2 - x - 2}{x - 1}$

VA
 $x-1 \neq 0$
 $x \neq 1$

HA
 $\frac{x^2}{x}$ None
 X check

Oblique

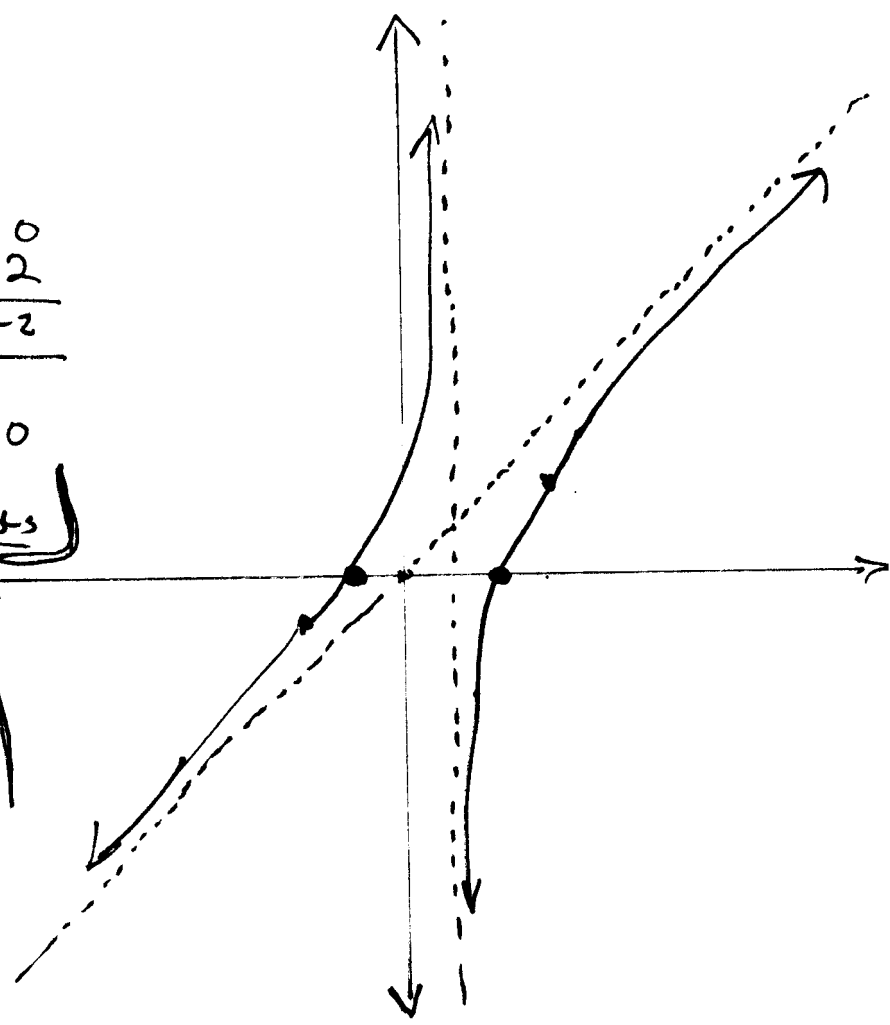
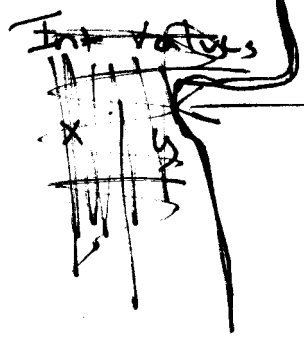
$$\begin{array}{r} 1 \overline{) 1 \ -1 \ -2} \\ \underline{1 \ 0 \ -2} \\ -2 \end{array}$$
 Oblique
 $y = 1x + 0$

Roots

$x^2 - x - 2 = 0$
 $(x-2)(x+1) = 0$
 $x = 2 \quad x = -1$

Int Values

x	y	Oblique
-2	-1	-2
.5		.5
1.5	-2.5	1.5
3	2	3



9

$$\begin{array}{r} X^3 - 3x^2 - 11x - 22 \\ X-3 \overline{) X^4 - 6x^3 - 2x^2 + 11x + 5} \\ \underline{-(X^4 - 3x^3)} \\ -X^4 + 3x^3 \\ \hline -3x^3 - 2x^2 + 11x + 5 \\ \underline{-(-3x^3 + 9x^2)} \\ +3x^3 - 9x^2 \\ \hline -11x^2 + 11x + 5 \\ \underline{-(-11x^2 + 33x)} \\ 11x^2 - 33x \\ \hline -22x + 5 \\ \underline{-(-22x + 66)} \\ 22x - 66 \\ \hline -61 \end{array}$$

$$X^3 - 3x^2 - 11x - 22 \quad -\frac{61}{X-3}$$

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a

$$\frac{x^3 + 9x^2 - 11x - 5}{x+4}$$

$$\begin{array}{r} -4 \overline{) 1 \quad -4 \quad 20 \quad -36} \\ \underline{1 \quad 9 \quad -11 \quad -5} \\ 1 \quad 5 \quad 9 \quad -41 \end{array}$$

$$1x^2 + 5x + 9 - 41 / x+4$$

b

$$\frac{x^3 + 5x - 4}{x-2}$$

Missing "x²" !!!

$$x-2$$

$$\frac{x^3 + 0x^2 + 5x - 4}{x-2}$$

$$x-2$$

$$\begin{array}{r} 2 \overline{) 1 \quad 0 \quad 5 \quad -4} \\ \underline{1 \quad 2 \quad 9 \quad 14} \end{array}$$

$$1x^2 + 2x + 9 + 14 / x-2$$