Polynomial + Rational Functions

$f(x) = -3x^5 + 2x^4 - 6x^2 + 7x - 1$

$\lim_{x \to -\infty} f(x) = +\infty$

$\lim_{x \to +\infty} f(x) = -\infty$

2)

$-x^8$

3) Synthetic Division

d) $2x^4+5x^3+4x^2-x-10=0$ $\pm1\ \pm2\ \pm5\ \pm10$

$x=\#$

1	2	5	4	-1	-10
	+0	2	7	11	10
	2	7	11	10	0

$(x-1)(2x^3+7x^2+11x+10)$

$-16+28-22+10=0$

-2	2	7	11	10
	+0	-4	-6	-10
	2	3	5	0

$(x-1)(x+2)(2x^2+3x+5)$

$x=1\quad x=-2$

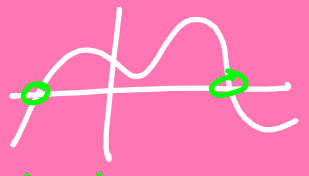
$x=\frac{-3\pm\sqrt{9-4(2)(5)}}{2(2)}$

$x=\frac{-3\pm\sqrt{9-40}}{4}$

$=\frac{-3\pm\sqrt{-31}}{4}$

$=\frac{-3\pm i\sqrt{31}}{4}$

4/ Zeros on calculator.

Graph. 

Menu-6-1

5) Roots: $-\frac{5}{3}, \pm 4i$

$X = -5/3$ $X = 4i$ $X = -4i$

$3x = -5$

$3x + 5 = 0$ $x - 4i = 0$ $x + 4i = 0$

FOIL $(3x+5)(x-4i)(x+4i)$

$(3x+5)(x^2 + 16i^2)$

$(3x+5)(x^2+16)$

$3x^3 + 5x^2 + 48x + 80 = 0$

6 Rational Functions

$$\left[4\left(\frac{3}{x-1}+\frac{2}{x+2}\right)\right](x-1)(x+2) \quad x \neq 1, -2$$

$$4(x-1)(x+2) = 3(x+2) + 2(x-1)$$

$$4 < \frac{3}{x-1} + \frac{2}{x+2}$$

1) Set < 0 or > 0
2) Make common denom.
3) Test Points

7) Partial Fractions

8) Simplify.

$$\frac{4x(2x-3)^{-1/3}(4x+5)^{-3} - 20x^2(2x-3)^{2/3}(4x+5)^{-4}}{\left[(2x-3)^{2/3}\right]^2}$$

$$\frac{4x(2x-3)^{-1/3}(4x+5)^{-4}\left[4x+5-5x(2x-3)\right]}{(4x+5)^{4}\,(2x-3)^{4/3+1/3}}$$

$$\frac{4x\left[4x+5-10x^2+15x\right]}{(4x+5)^4(2x-3)^{5/3}}$$

$$\frac{4x\left[-10x^2+19x+5\right]}{(4x+5)^4(2x-3)^{5/3}}$$