EXAMPLE B: $P(x) = 3x^4 - 4x^3 - 22x^2 + 15x + 18$

$P(x) \to +\infty$ as $x \to \pm\infty$ (End Behavior)

Descartes rule of signs tells us that there are 0 or 2 positive real zeros and 0 or 2 negative real zeros; $P(-x) = 3x^4 + 4x^3 - 22x^2 - 15x + 18$

Rational zeros: $\frac{p}{q} \in \left\{\pm 1, \pm 2, \pm 3, \pm 6, \pm 18, \pm\frac{1}{3}, \pm\frac{2}{3}\right\}$

(1)

	3	-4	-22	15	18	
6	3	14	62	large +	large +	← upper bound
* 3	3	5	-7	-6	0	← positive zero
~~2~~	~~3~~	~~2~~	~~-18~~	~~-21~~	-24	
2/3	3	-2	clearly not going to come out zero			
1/3	3	-3	-23	not going to come out to zero!		
1	3	-1	-23	-8	10	
-2/3	3	-6	-18	27	0	← negative zero
-1	3	-7	-15	0	17	
-3	3	-13	17	-57	large +	lower bound
3	3	5	-7	-6		Depressed poly. for $x=3$
3	3	14	35	not 0		

* If you try to see if a double zero, it is not.

(2) Now use depressed polynomial at $x=3$ to find irrational zeros.

START with

	3	5	-7	-6
-2/3	3	3	-9	0 ←

"plug-in" the other zero $x = -2/3$ to reduce more

(3) now use next depressed polynomial and solve it because it is of degree two.

$$3x^2 + 3x - 9 = 0$$

$$3(x^2 + x - 3) = 0$$

so $$x = \frac{-1 \pm \sqrt{1+12}}{2} = \frac{-1 \pm \sqrt{13}}{2}$$

So the other two zeros are $x \approx 1.30$

or $x \approx -2.30$