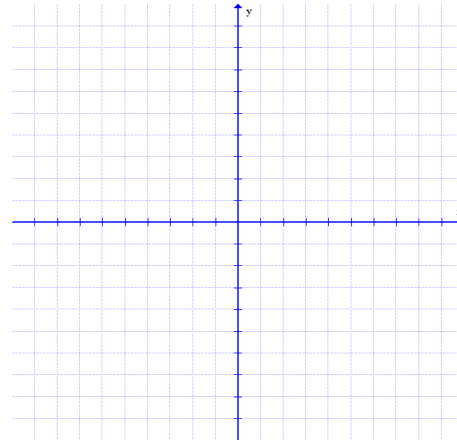


## 1.9 Rational Zero Test

e.g.1: Sketch  $f(x) = x^4 - x^3 - x^2 + x$



e.g.2: Sketch  $f(x) = x^3 - 6x^2 + 3x + 10$  \*can't factor with grade 10 methods  
\* use factor theorem

### RATIONAL ZERO TEST

Given  $P(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + a_2 x^2 + a_1 x + a_0$  where  $a_n, a_{n-1}, a_{n-2}, \dots, a_2, a_1, a_0$  are integers, every rational zero of  $P(x)$  is in the form  $p/q$  where  $p$  is a factor of the constant  $a_0$  and  $q$  is a factor of the leading coefficient  $a_n$

e.g. 3: Given  $P(x) = 2x^3 - 4x^2 + 6x - 10$

a) Find all possible rational roots

b) Factor  $P(x)$

e.g.4: Sketch  $f(x) = 3x^3 + 2x^2 - 7x + 2$

