

Thursday, September 15, 2016

- Get your Plicker!
- 2.3 - Graphing Polynomials



$$\textcircled{28} f(x) = x^3 - x^4 + 3x^2 - 2x + 7$$

$$\text{Deg} = 4$$
$$\text{LC} = -1$$

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

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

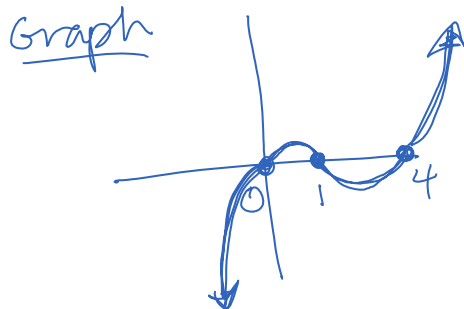
2.3 Graphing Polynomials - Zeros

* Polynomial with degree N has at most N zeros.

① Find zeros of $f(x) = x^3 - 5x^2 + 4x$

$$0 = x(x^2 - 5x + 4)$$
$$0 = x(x-4)(x-1)$$

Zeros: $x = 0, 4, 1$



Multiplicity of Zeros

$$\textcircled{2} f(x) = (x-1)(2x+5)^2(x-4)^3$$

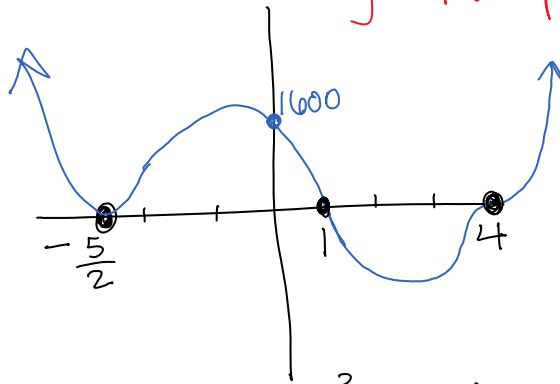
$$\text{Degree} = 6$$

\uparrow
 $x=1$
 happens
 one
 time
Odd
 Multiplicity

\uparrow
 $x = \frac{-5}{2}$
 happens
 twice
Even
 Multiplicity

$x=4$
 happens
 3 times
Odd
 Multiplicity

L.C. = T



y-intercept
 Set $x=0$
 $y = (0-1)(2(0)+5)^2(0-4)^3$
 $= (-1)(25)(-64)$
 $= 1600$

③ $f(x) = -\frac{1}{4}(x+2)^3(x-5)$

Deg = 4
 L.C. = $-\frac{1}{4}$ (neg)

Zeros = $x=5, -2$ ← odd cubic

y-int = $x=0$
 $y = -\frac{1}{4}(0+2)^3(0-5)$
 $= -2(-5) = 10$

