2/12 TUE

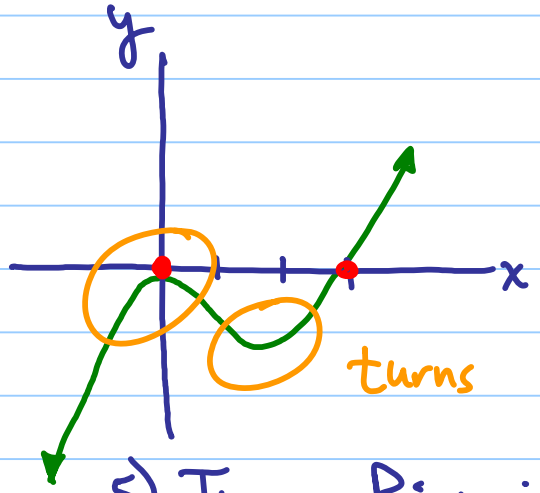
2.3 (part 2) Polynomials

Graphing Polynomials

1) Determine End Behavior
2) x-intercepts - (Multiplicity: Crosses or touches) — odd / even
   roots / zeros / solutions
3) y-intercepts
4) Symmetry: ($f(-x)=f(x)$: y-axis / $f(-x)=-f(x)$: origin) — even / odd; horiz refl / rot sym
5) Using turning points to draw the graph
   → one less than the degree.

ex 7) Graph $f(x) = x^3 - 3x^2$

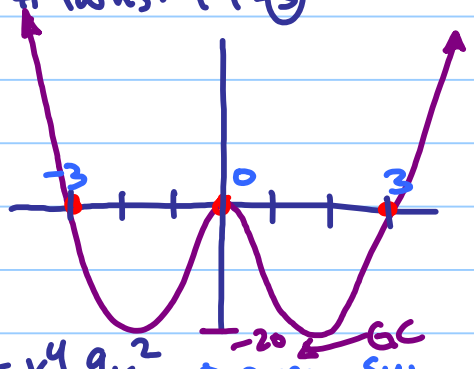
1) falls left, rises right
2) x-int: $0 = x^3 - 3x^2$
   $0 = x^2(x-3)$
   $x=0$ | $x=3$
   multiplicity of 2 → touches; mult of 1 → crosses
3) y-int: $f(0) = 0^3 - 3(0)^2 = 0$
4) Symm: $f(-x) = (-x)^3 - 3(-x)^2$
   $= -x^3 - 3x^2$
   → neither



5) Turning Points: (2)

ex 8) $f(x) = x^4 - 9x^2$

1) rise left & rise right
2) x-ints: $0 = x^4 - 9x^2$
   $0 = x^2(x^2-9)$
   $0 = x^2(x-3)(x+3)$
   touches @ 0 | crosses @ 3, -3
3) y-int: $f(0) = 0^4 - 9(0)^2 = 0$
4) Symm: $f(-x) = (-x)^4 - 9(-x)^2 = x^4 - 9x^2$ → even: Symm y-axis
5) # turns: 4-1 = (3)



HW p312
42, 46, 48, 52, 58, 60, 64