LECTURE 18 part I : revision for mid-sem

* $z = x+iy$ " = " (x,y)
  "
  $re^{i\theta}$
* $\mathbb{C}$ as a field (not ordered, can't be ordered)
* Arg vs arg (vs Qrg)
* $e^{i\theta} = \cos\theta + i\sin\theta$
* $e^{in\theta} = \cos n\theta + i\sin n\theta$
* nth roots
* quadratic formula
* F?s as mappings (linear, $1/z$)
* Möbius transformations
  In partic $\left\{\begin{matrix}\text{circles}\\ \text{lines}\end{matrix}\right\} \to \left\{\begin{matrix}\text{circles}\\ \text{lines}\end{matrix}\right\}$
* Riemann sphere
* $\bar{\mathbb{C}}$, Möbius transformations : $\bar{\mathbb{C}} \to \bar{\mathbb{C}}$
* inverse F?s (inv of exp?)
* Log vs Log (vs Log).
* branch, branch cut.
* trig & hyperbolic F?s (inverses, zeros, identities).
* bounded & unbded F?s & sets.
* basic topology on $\bar{\mathbb{C}}$ (& on $\mathbb{C}$)

* limits (including ∞)
  continuity, differentiability.
  Cauchy-Riemann eq^n's
  * rectangular
  * polar
  * (Wirtinger)
* C/R as necessary cond^s for $\mathbb{C}$-diff^{bility}.
* Sufficient cond^s for $\mathbb{C}$-diff^{bility}.
* Analytic f^n's
* Analytic vs diff^{ble}.

(real analytic vs smooth f^n's in $\mathbb{R}^n$:)
not examinable in mid-sem.