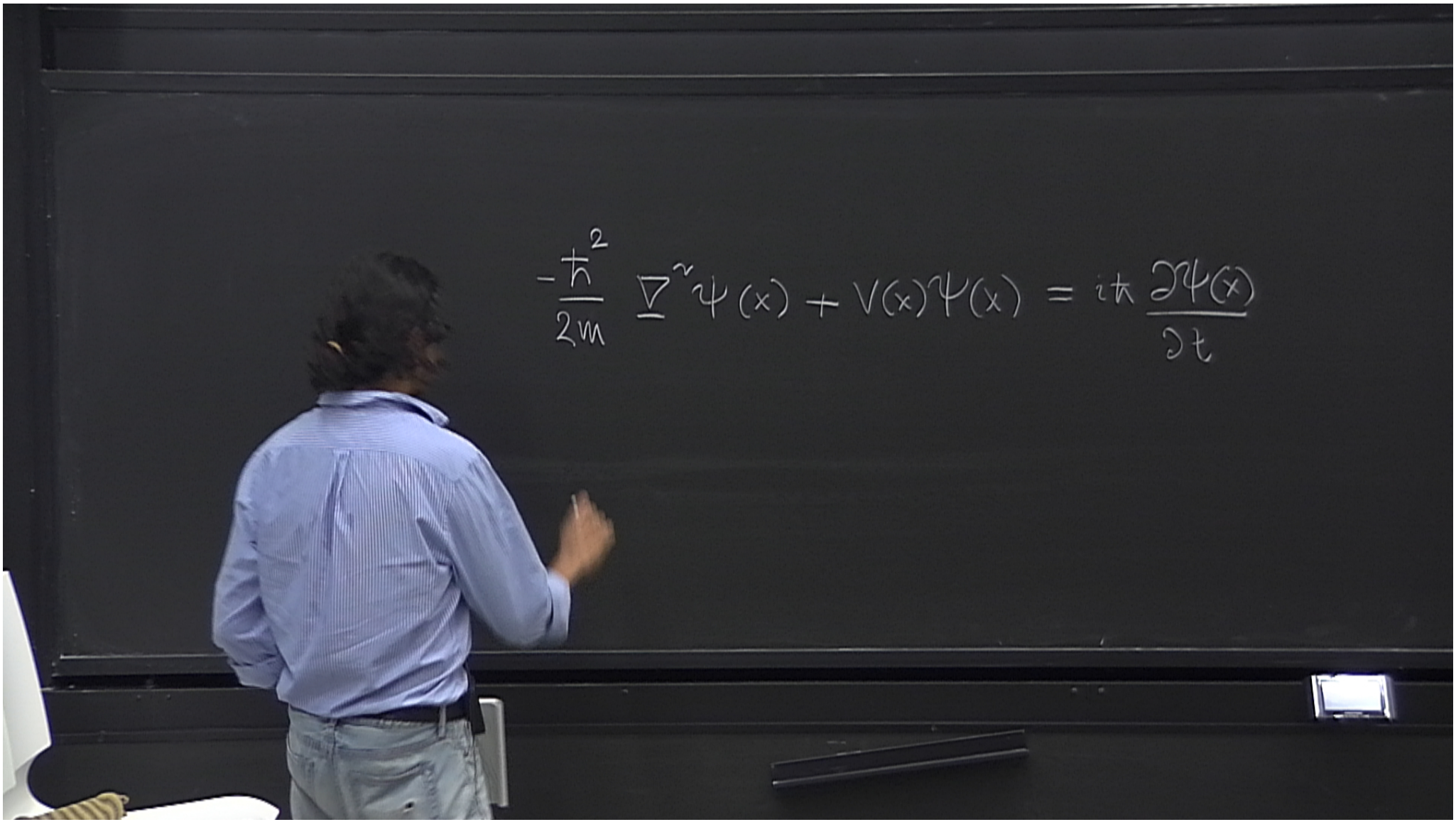
Title: Complex Analysis - Lecture 1

Date: Aug 14, 2012 09:00 AM

URL: http://pirsa.org/12080012

Abstract:


$-\frac{\hbar^2}{2m}\nabla^2\psi(x) + V(x)\psi(x) = i\hbar\frac{\partial\psi(x)}{\partial t}$

$$(x) = i\hbar \frac{\partial \psi(x)}{\partial t}$$

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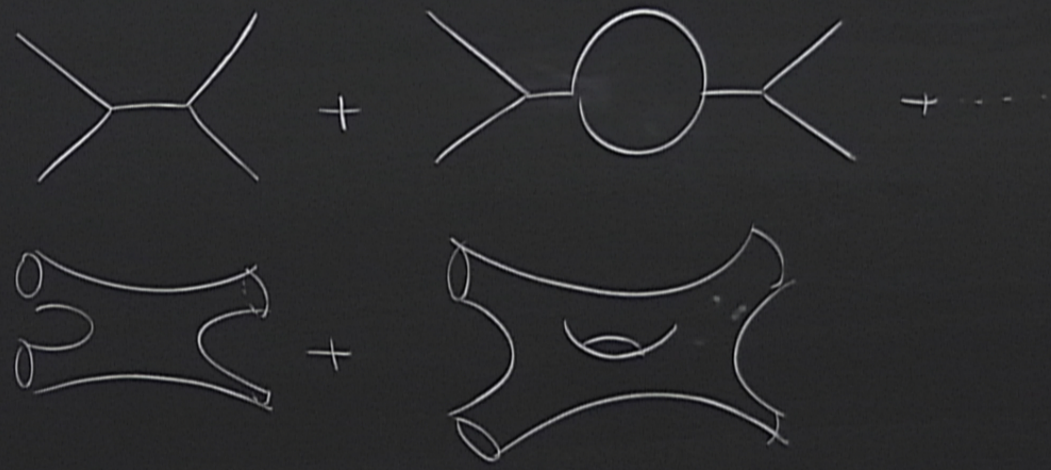
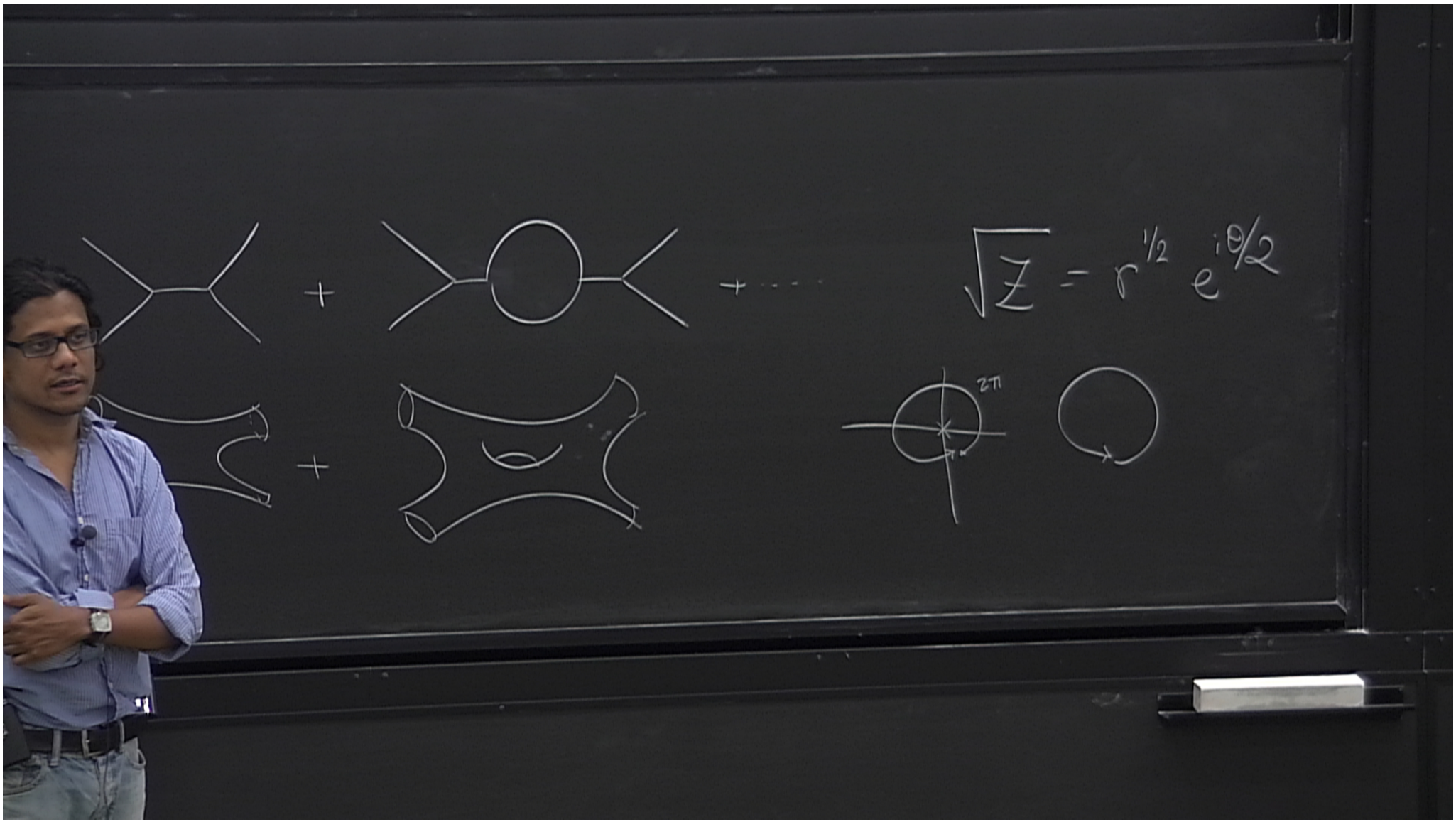
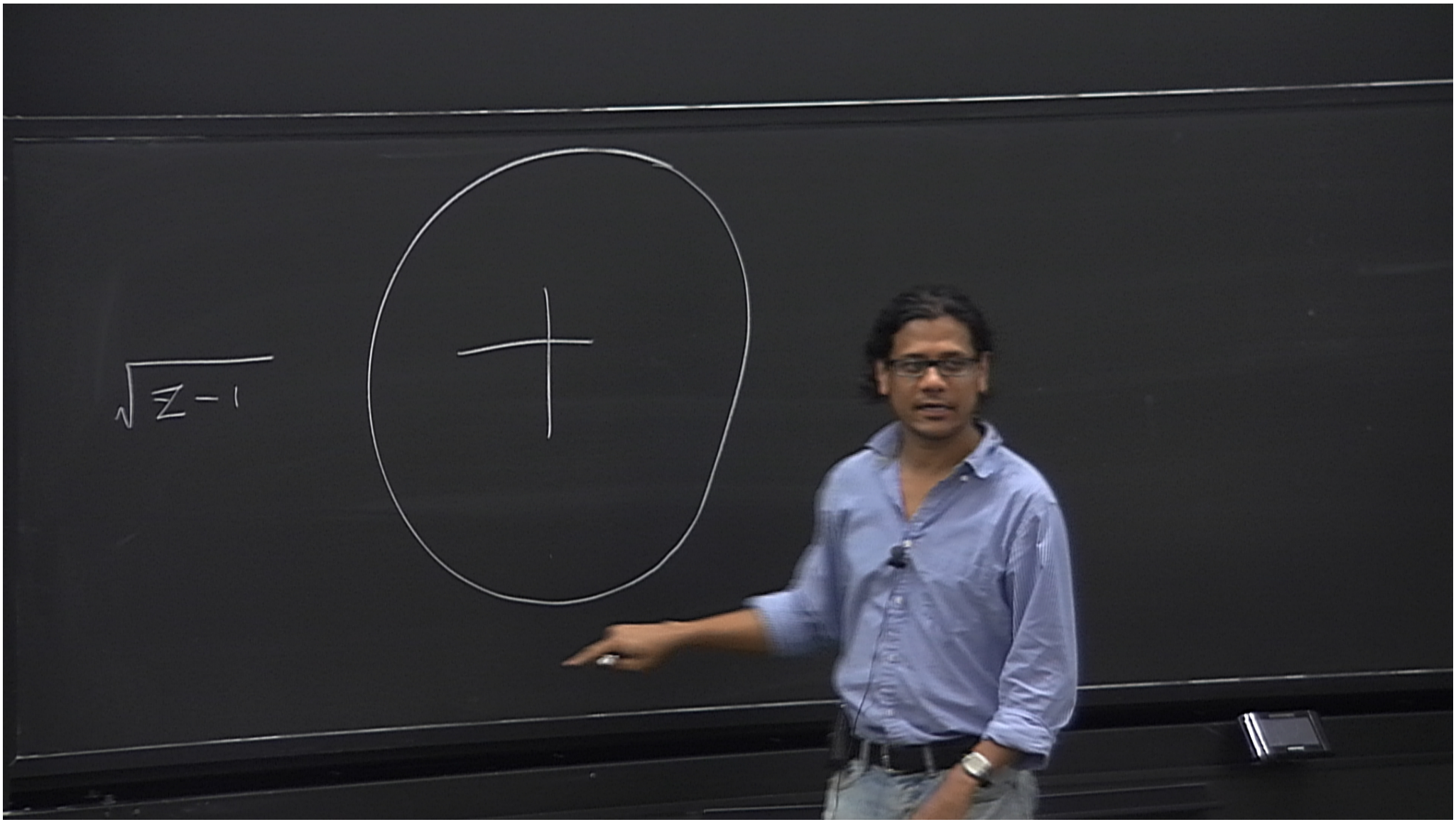
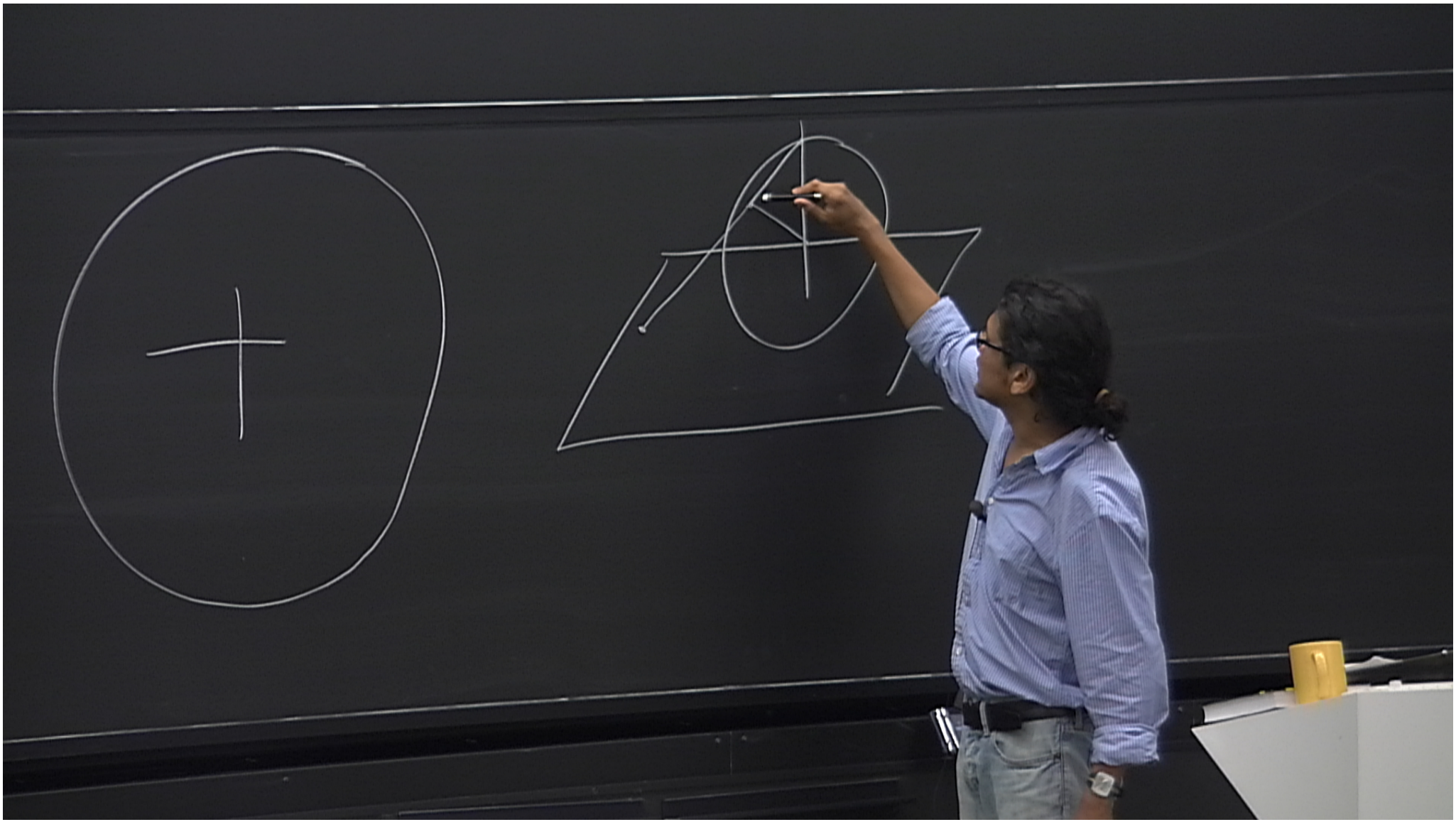
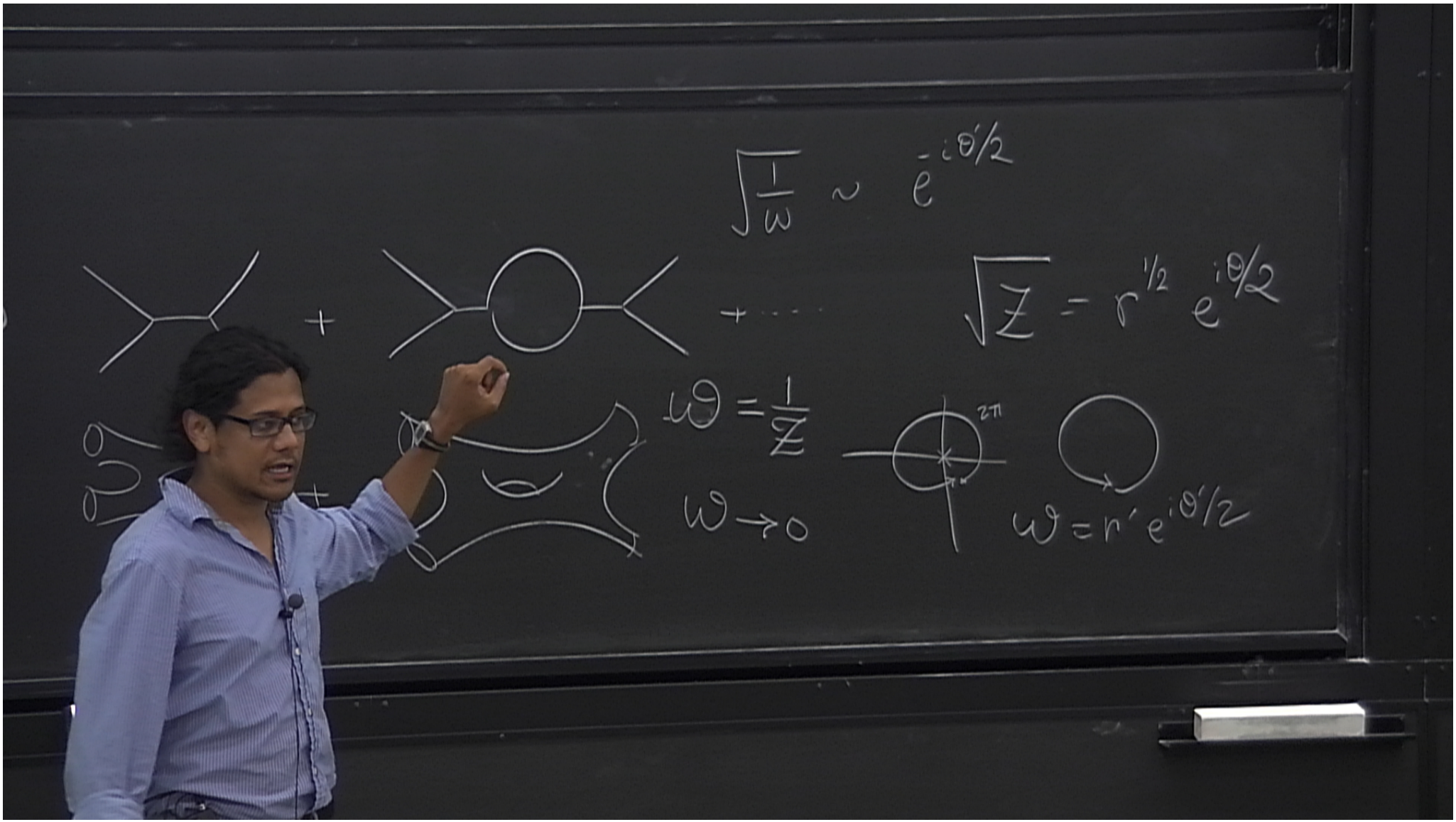
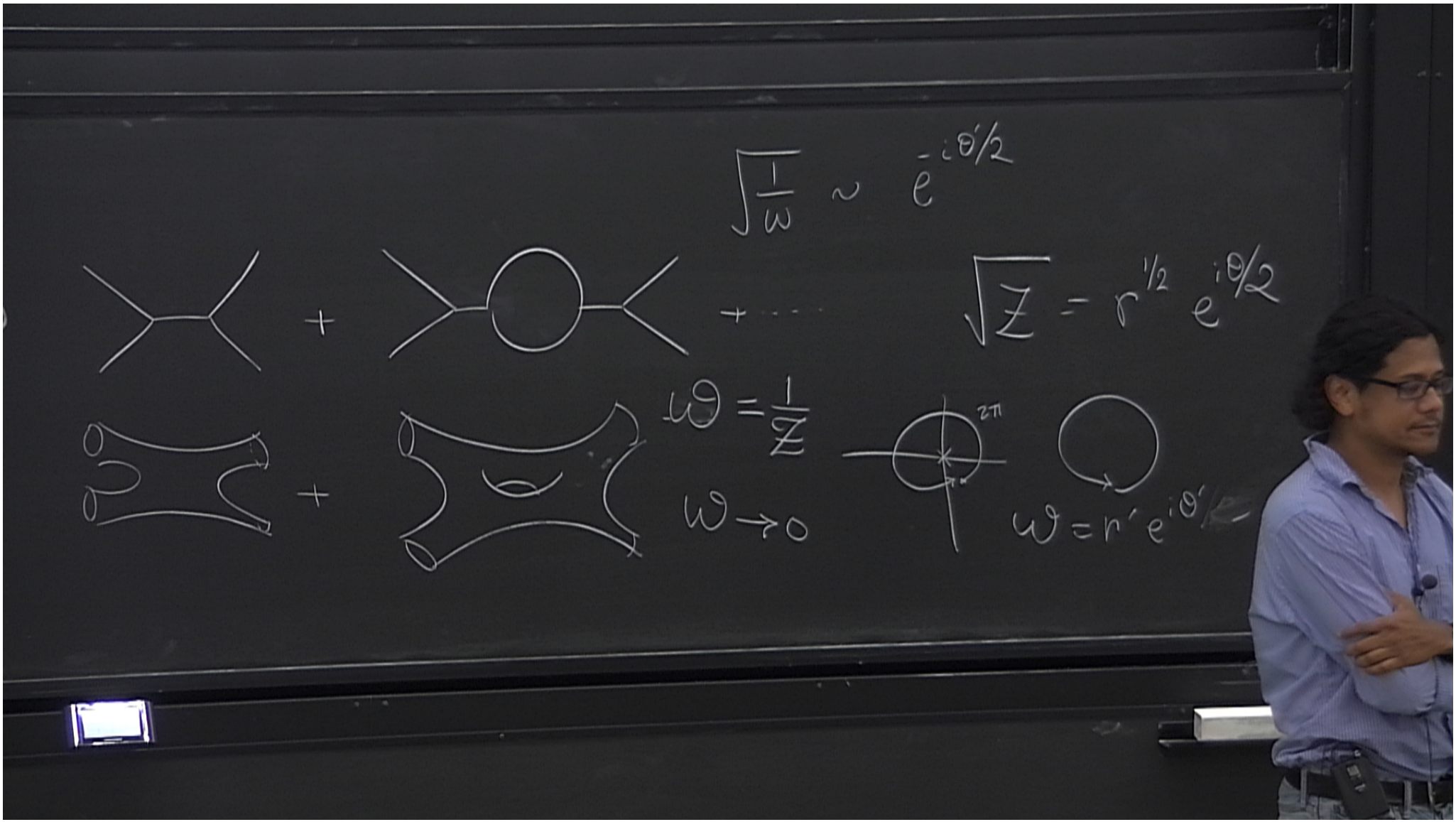


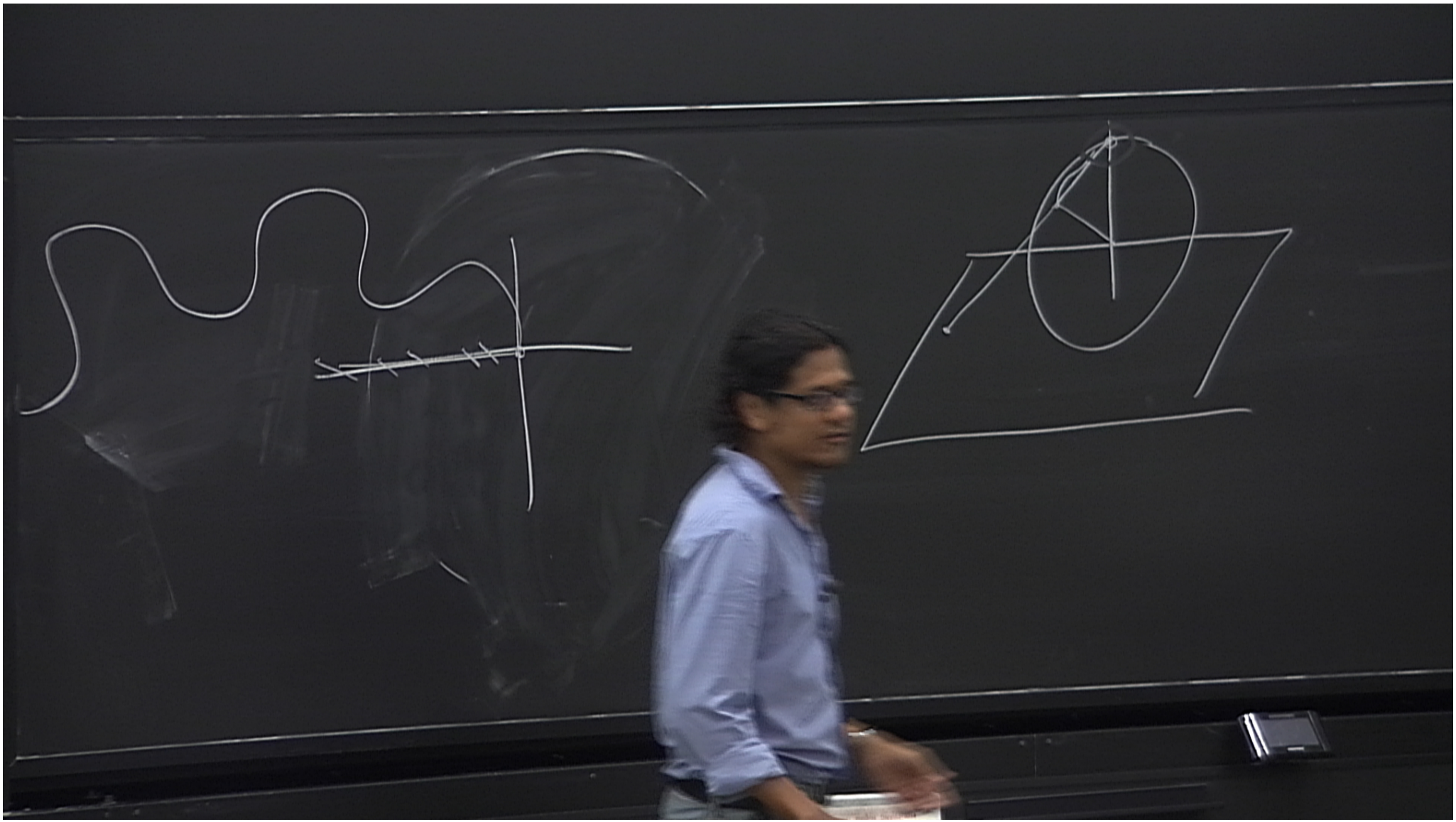

+
+ ...
$\sqrt{Z} = r^{1/2} e^{i\theta/2}$
+
2π
π

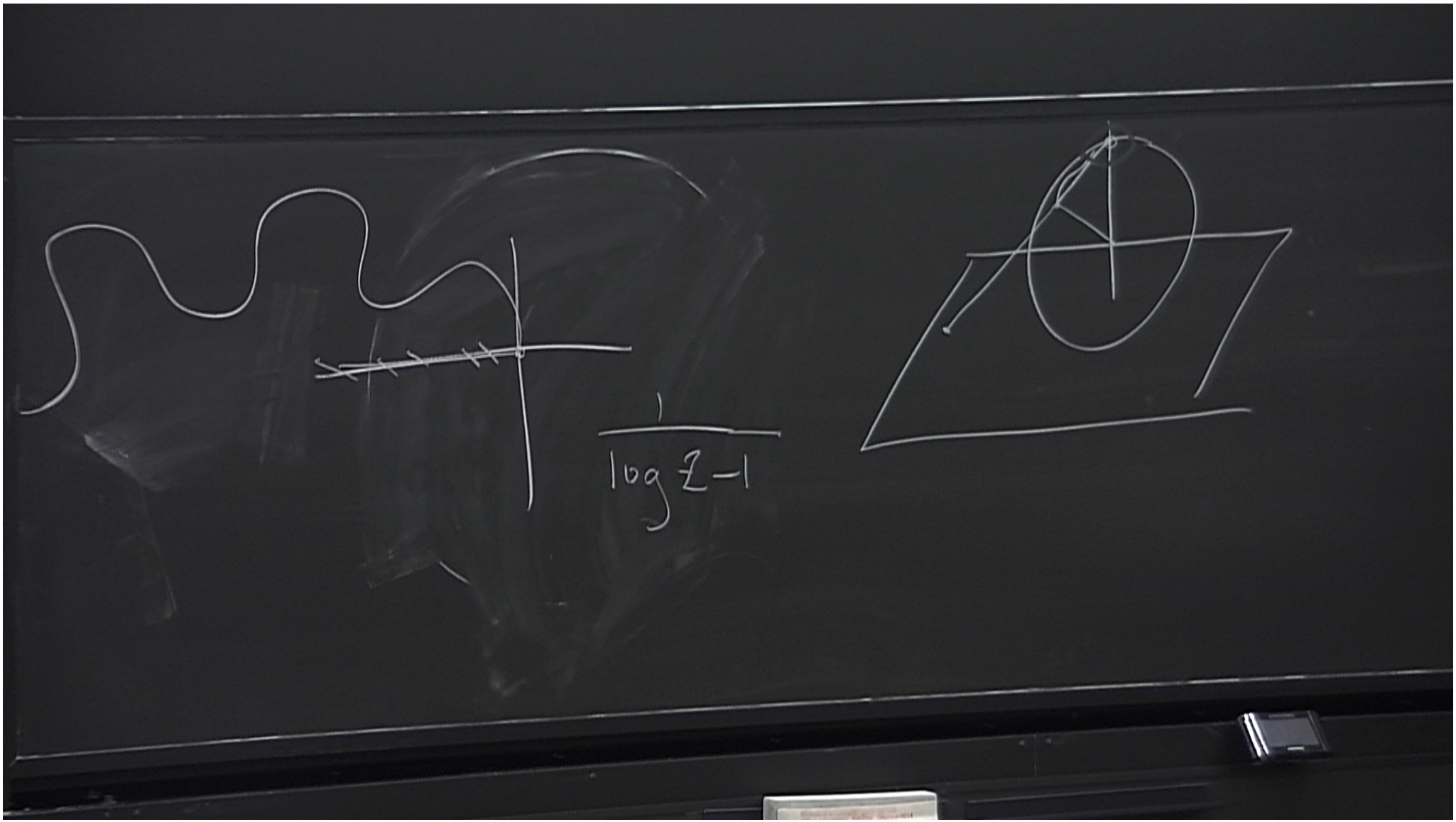

$\sqrt{z-1}$

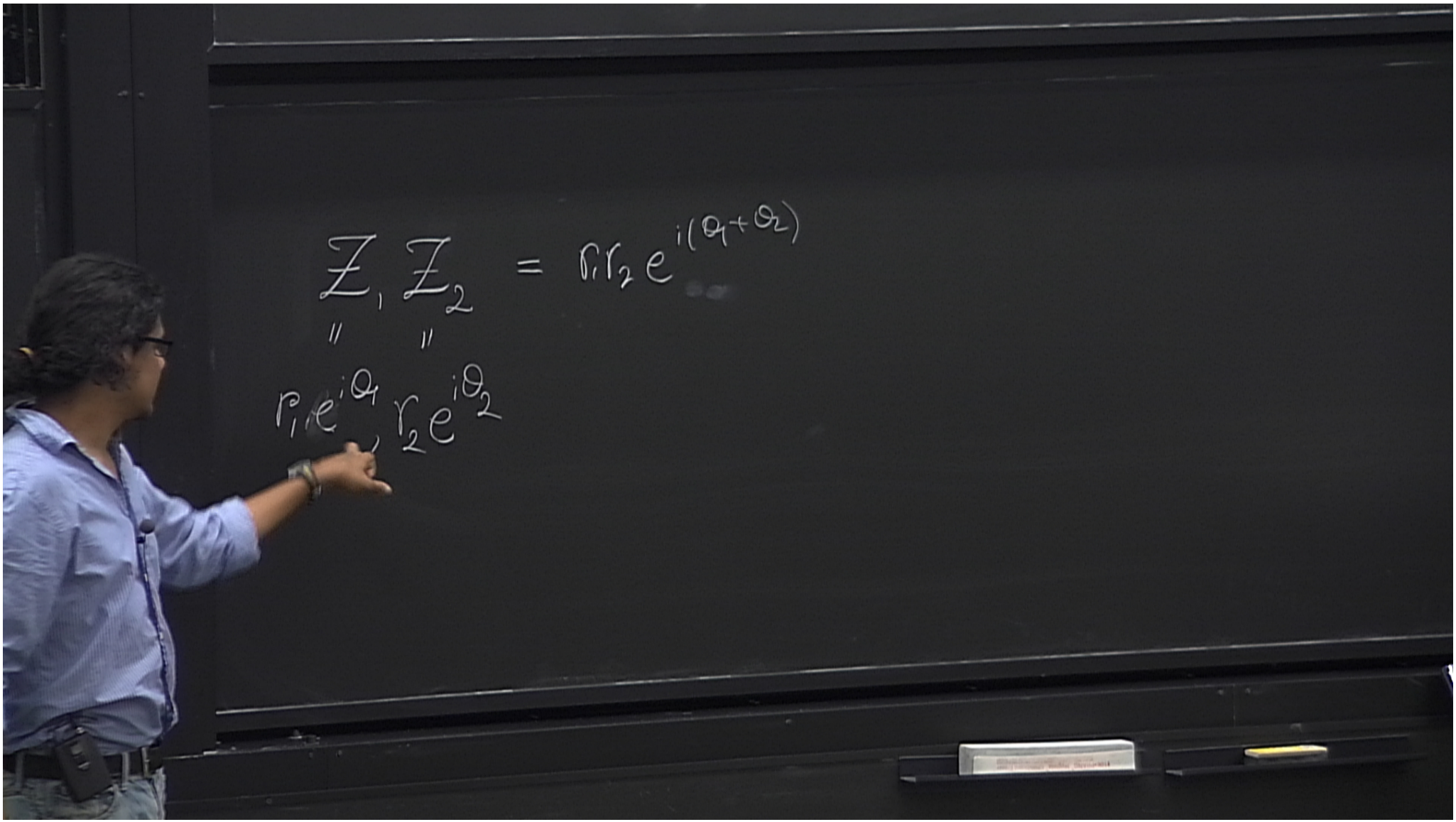


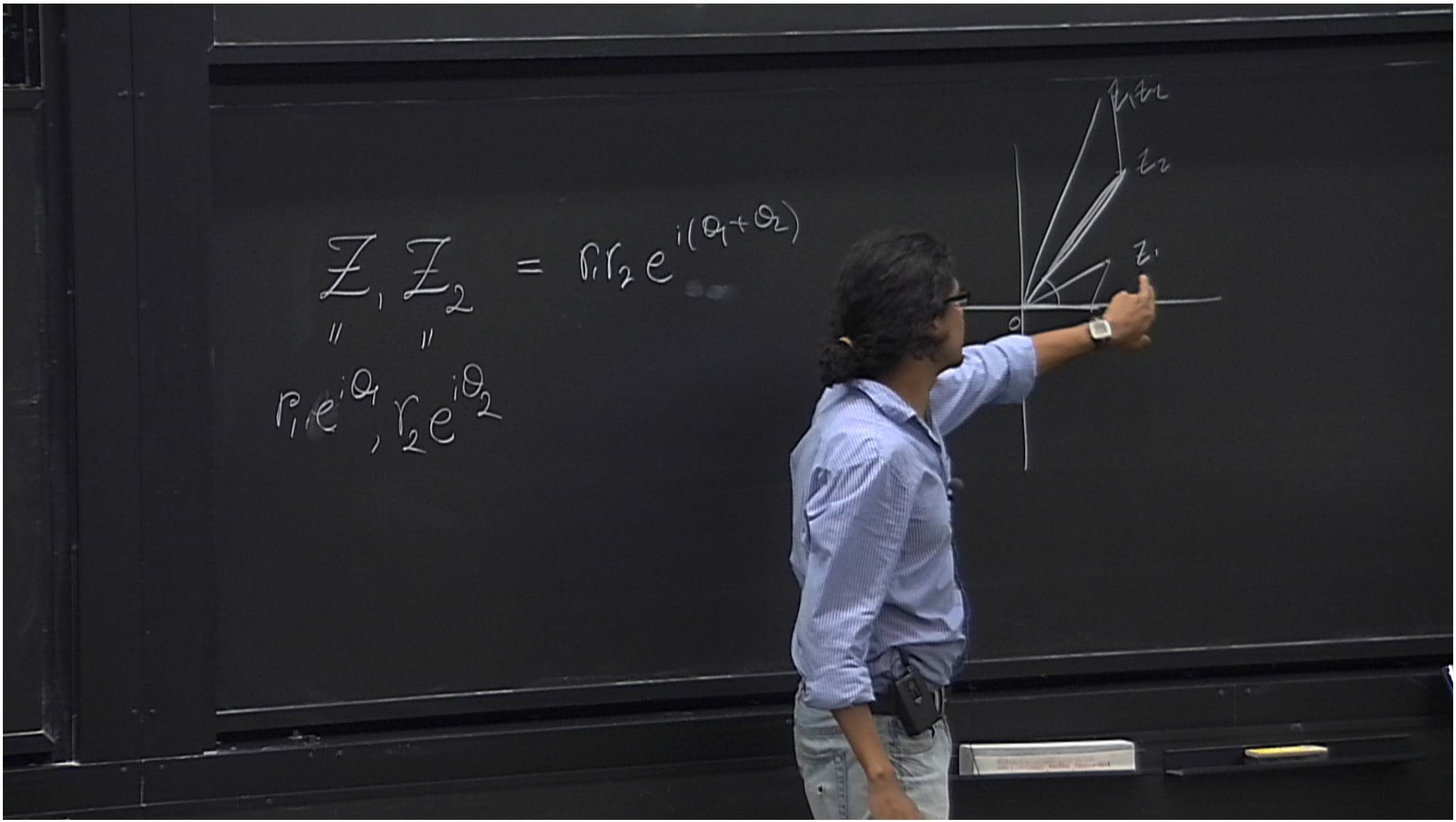

$\sqrt{\frac{1}{w}} \sim e^{-i\theta'/2}$
$\sqrt{Z} = r^{1/2} e^{i\theta/2}$
$w\theta = \frac{1}{Z}$
$w \to 0$
2π
$w = r' e^{i\theta'/2}$


$\sqrt{\frac{1}{w}} \sim e^{-i\theta'/2}$
$\sqrt{Z} = r^{1/2} e^{i\theta/2}$
$w = \frac{1}{Z}$
$w \to 0$
2π
$w = r' e^{i\theta'}$



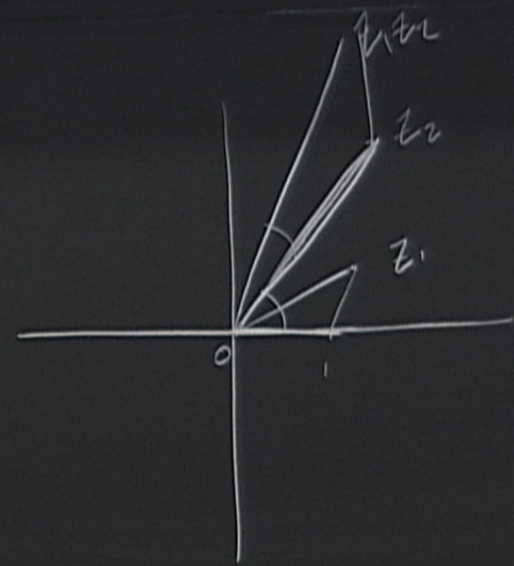

$\frac{1}{\log z - 1}$


$Z_1 Z_2 = r_1 r_2 e^{i(\theta_1+\theta_2)}$
$Z_1 = r_1 e^{i\theta_1}$, $Z_2 = r_2 e^{i\theta_2}$


$Z_1 Z_2 = r_1 r_2 e^{i(\theta_1+\theta_2)}$
$r_1 e^{i\theta_1}, r_2 e^{i\theta_2}$
$z_1 z_2$
z_2
z_1
0

$$Z_1 Z_2 = r_1 r_2 e^{i(\theta_1+\theta_2)}$$

$$Z_1 = r_1 e^{i\theta_1}, \quad Z_2 = r_2 e^{i\theta_2}$$



i^{4002}

$i^2 = -1$

$i^4 = +1$

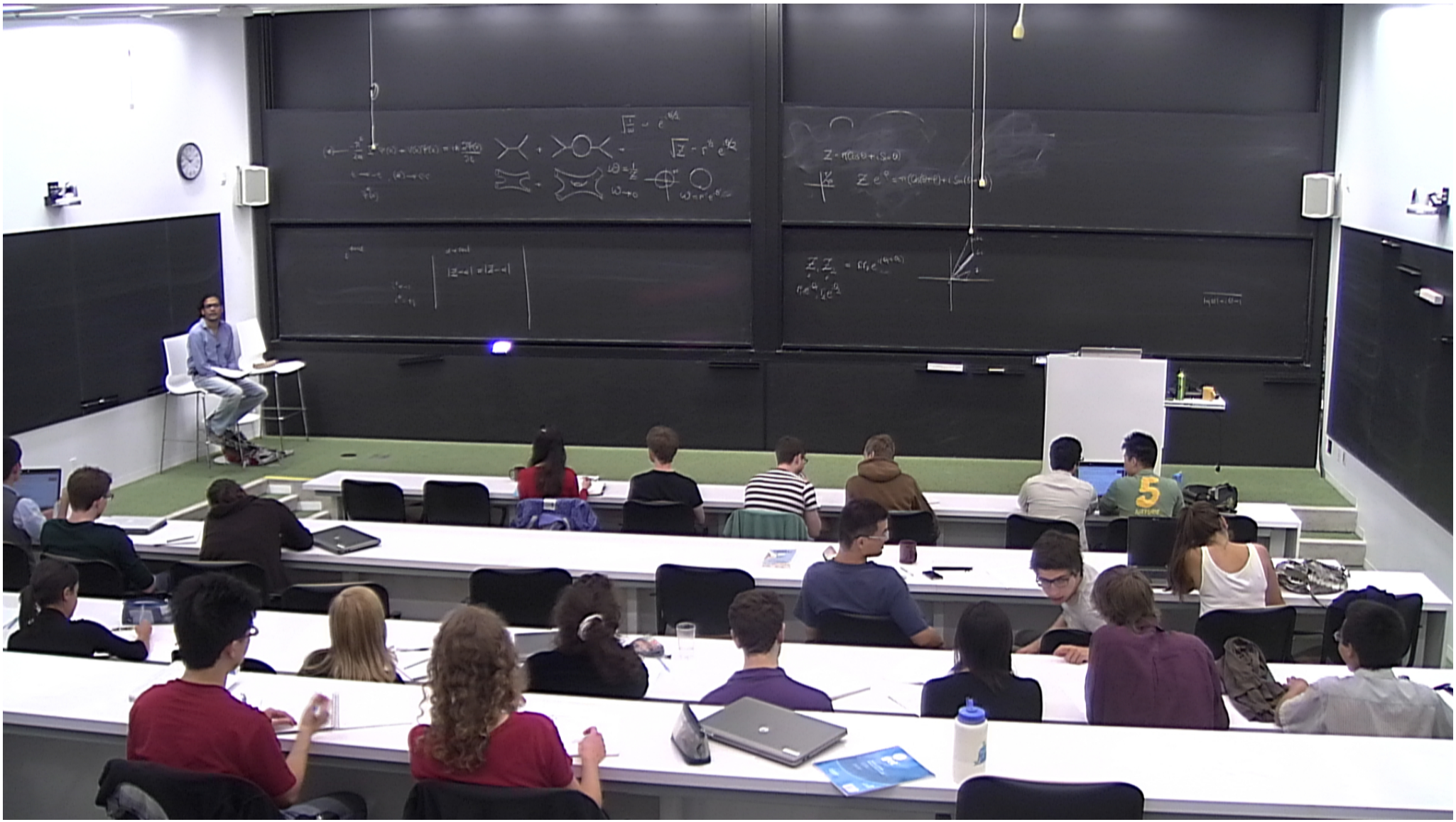
i^{4002}

$i^2 = -1$

$i^4 = +1$

$\alpha \to$ real

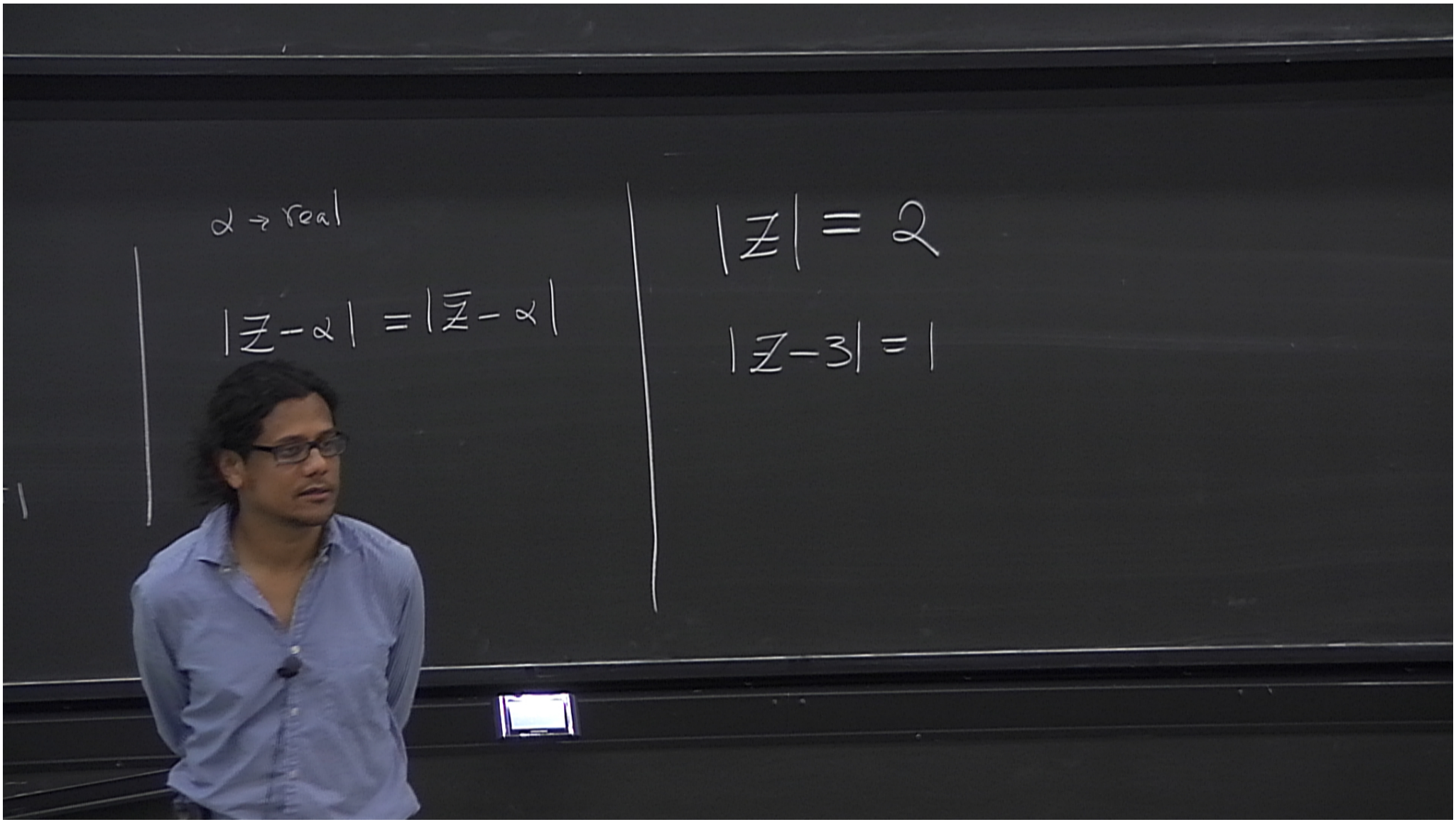
$$|z - \alpha| = |\bar{z} - \alpha|$$



$\alpha \to$ real

$$|z-\alpha| = |\bar{z}-\alpha|$$

$$|z| = 2$$


α → real
|z − α| = |z̄ − α|
|z| = 2
|z − 3| = 1

$-\alpha|$

$|z| = 2$

$|z-3| = 1$

$|z+1+i| = 1$

$|z-1| = |z+1|$

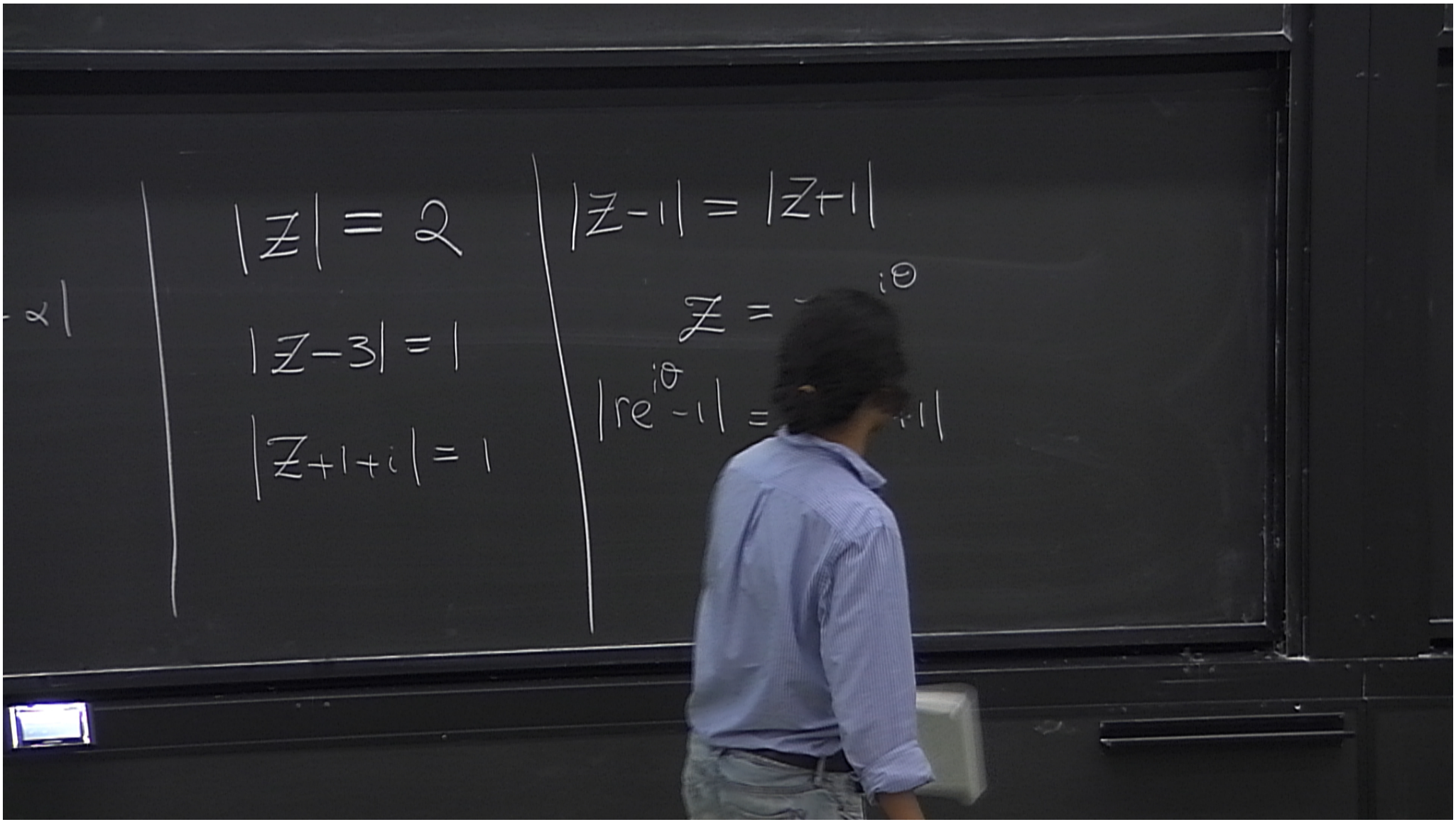
$-\alpha|$

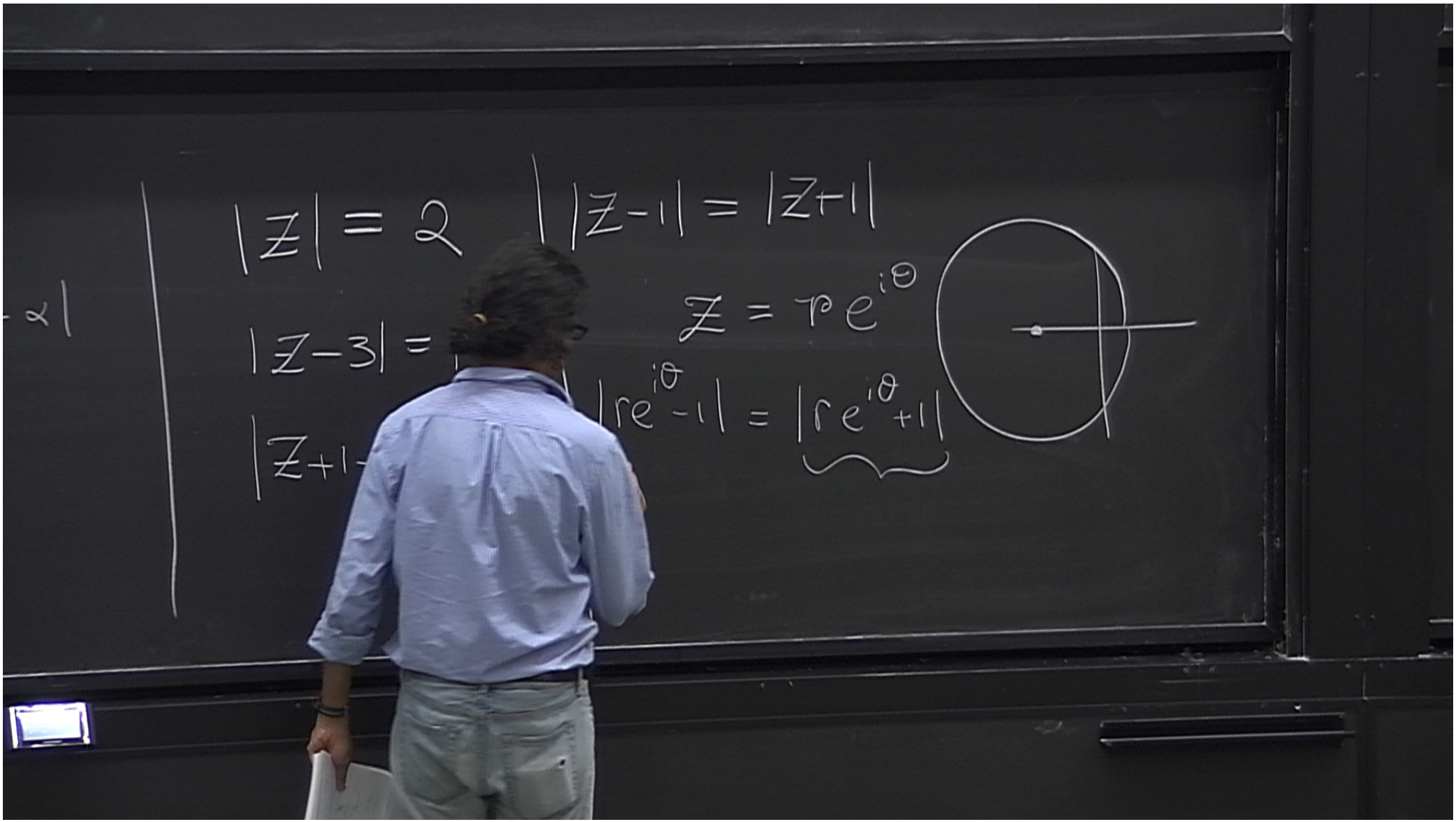
$|z| = 2$

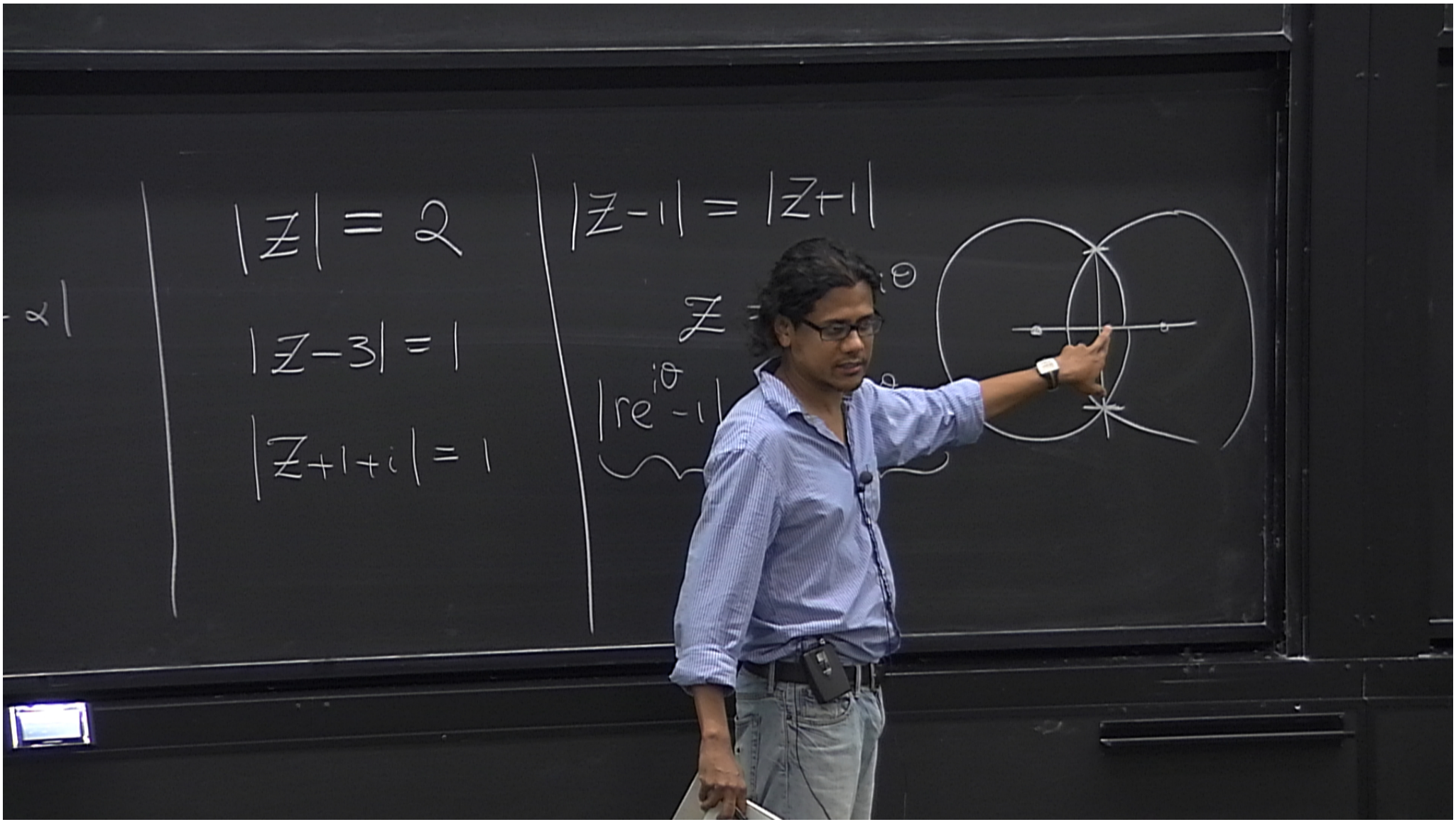
$|z-3| = 1$

$|z+1+i| = 1$

$|z-1| = |z+1|$


|z| = 2
|z−3| = 1
|z+1+i| = 1
|z−1| = |z+1|


|z| = 2
|z-1| = |z+1|
z = re^{iθ}
|re^{iθ}-1| = |re^{iθ}+1|


|z| = 2
|z−3| = 1
|z+1+i| = 1
|z−1| = |z+1|
|re^{iθ} −1|

$-\alpha|$

$|z| = 2$

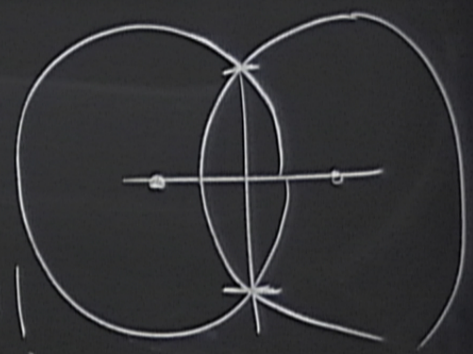
$|z-3| = 1$

$|z+1+i| = 1$

$|z-1| = |z+1|$

$z = re^{i\theta}$

$\underbrace{|re^{i\theta}-1|} = \underbrace{|re^{i\theta}+1|}$



$$|z| = 2$$

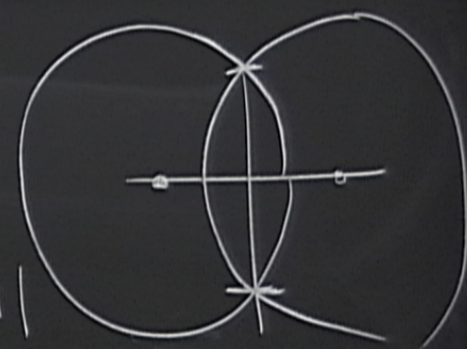
$$|z-3| = 1$$

$$|z+1+i| = 1$$

$$\boxed{2|z-1| = |z+1|}$$

$$z = re^{i\theta}$$

$$\underbrace{|re^{i\theta}-1|} = \underbrace{|re^{i\theta}+1|}$$



$$\tan 4\theta = \frac{4\tan\theta - 4\tan^3\theta}{1 - 6\tan^2\theta + \tan^4\theta}$$

De Moivre:

$$\cos 4\theta + i \sin 4\theta = (\cos\theta + \sin\theta)^4$$

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$$\cos 4\theta + i \sin 4\theta = (\cos\theta + \sin\theta)^4$$

$$\boxed{-1 = z^3}$$ ~ what are the values of z?