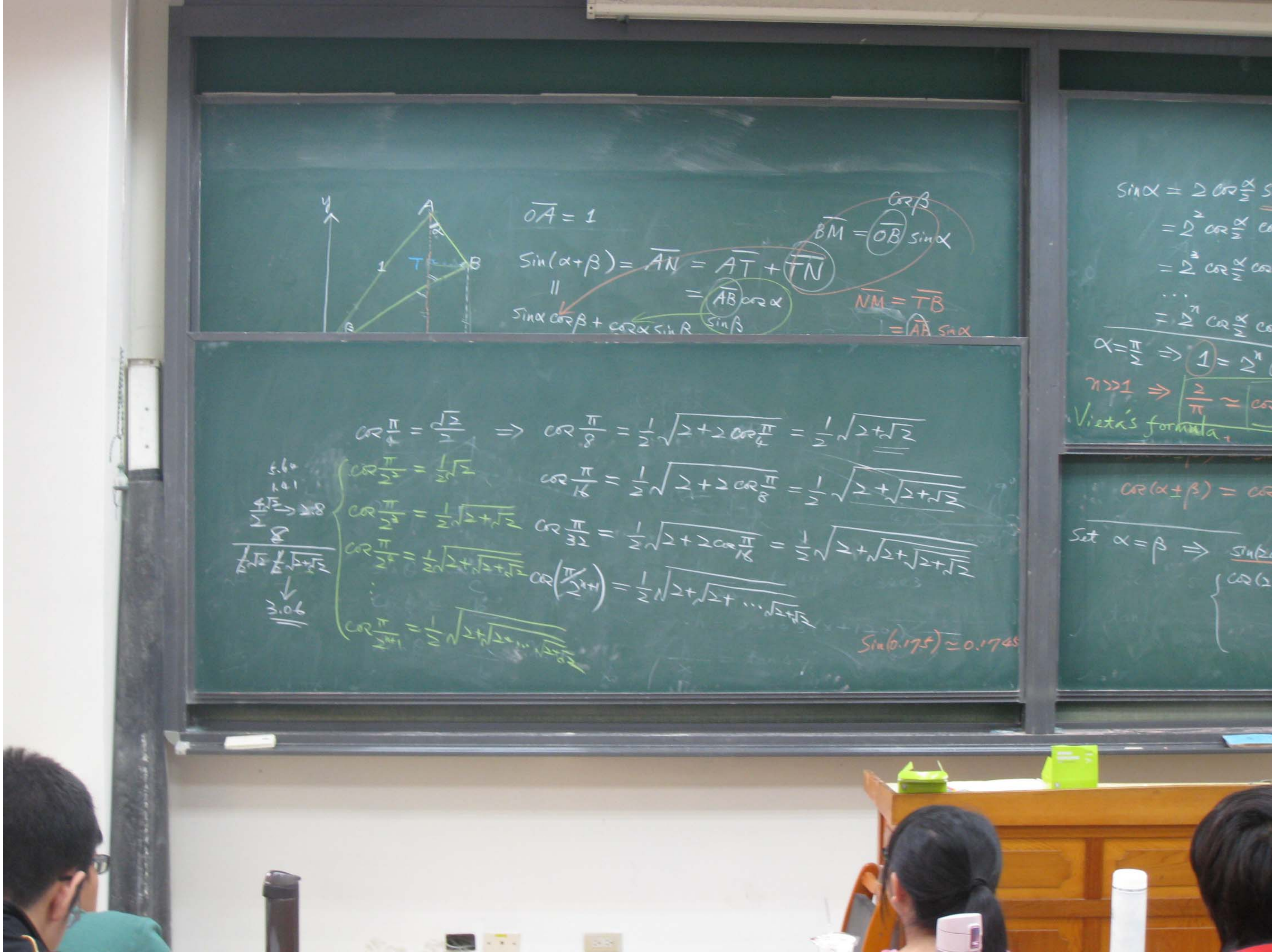
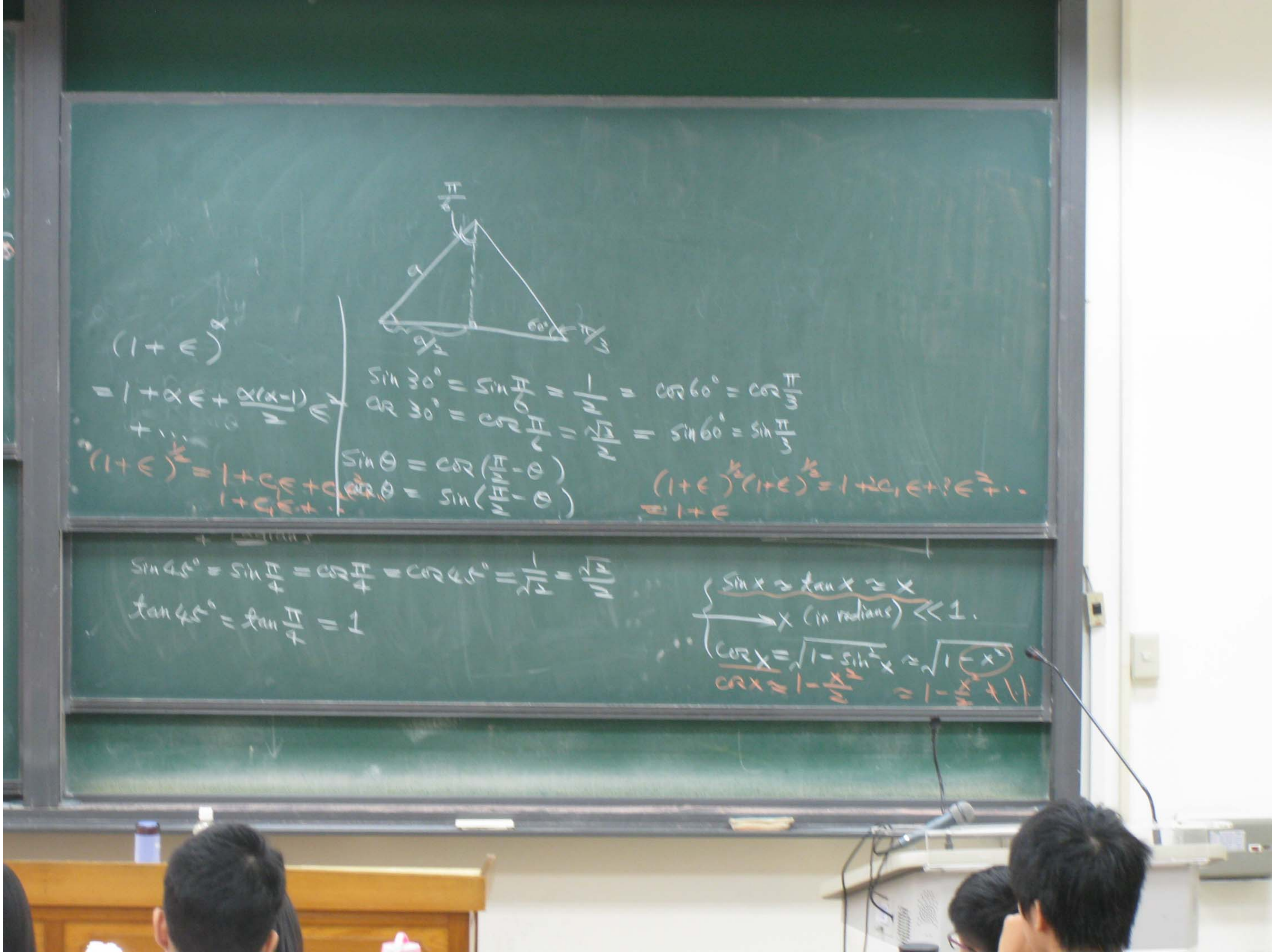
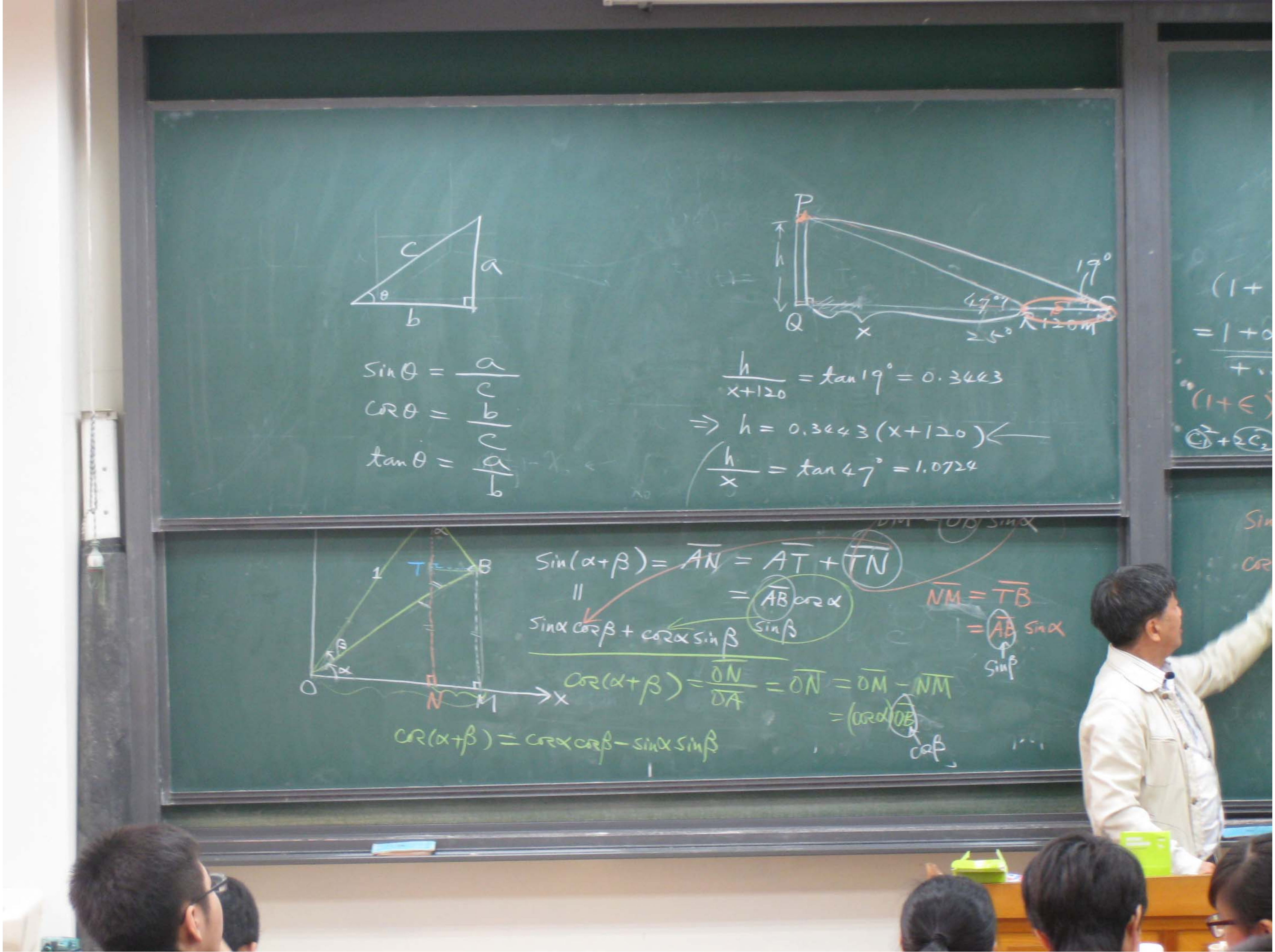
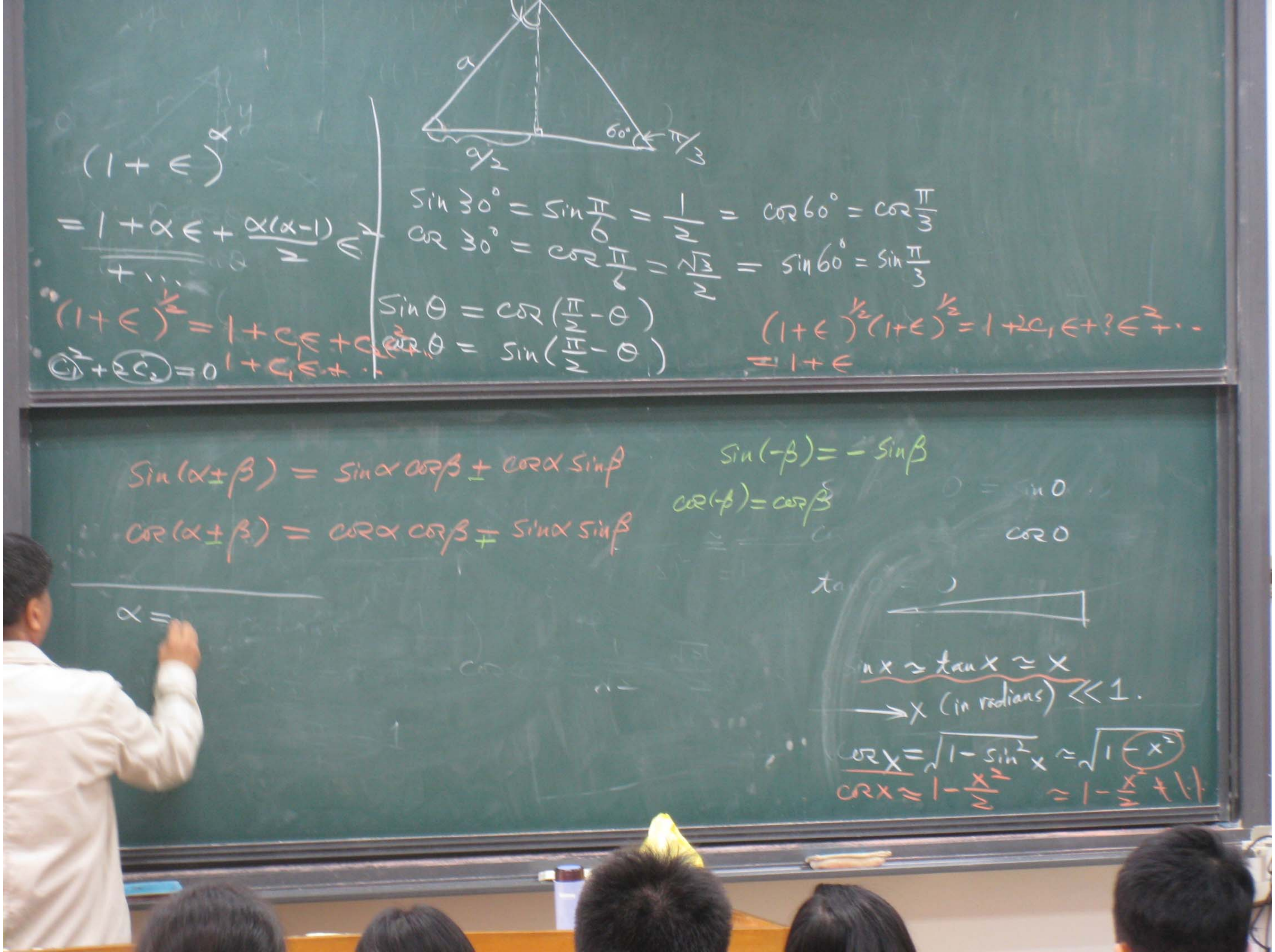


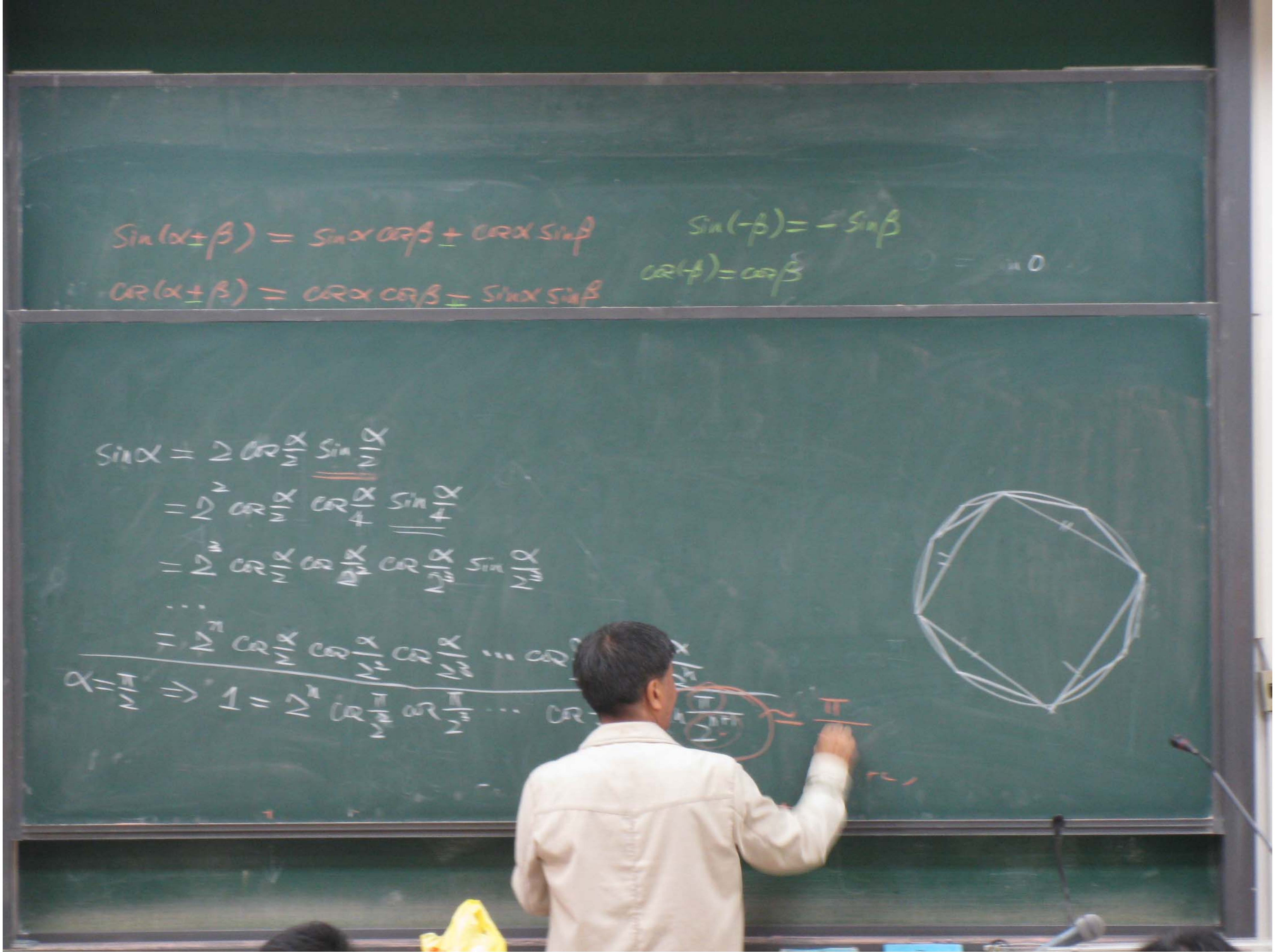
OA = 1
Sin(α+β) = AN = AT + TN
= AB cos α
sinα cosβ + cosα sinβ
BM = OB sinα
cosβ
NM = TB
= AB sinα
sinβ
cos π/4 = √2/2 => cos π/8 = 1/2 √(2+2cos π/4) = 1/2 √(2+√2)
cos π/16 = 1/2 √(2+2cos π/8) = 1/2 √(2+√(2+√2))
cos π/32 = 1/2 √(2+2cos π/16) = 1/2 √(2+√(2+√(2+√2)))
cos(π/2^(n+1)) = 1/2 √(2+√(2+...√(2+√2)))
cos π/2² = 1/2 √2
cos π/2³ = 1/2 √(2+√2)
cos π/2⁴ = 1/2 √(2+√(2+√2))
cos π/2^(n+1) = 1/2 √(2+√(2+...√(2+√2)))
3.06
Sin(0.175) ≃ 0.1745
sinα = 2 cos α/2
= 2² cos α/2
= 2³ cos α/2
= 2ⁿ cos α/2
α = π/2 => 1 = 2ⁿ
n>>1 => 2/π ≃
Vieta's formula
cos(α±β) =
Set α = β =>


$\frac{\pi}{6}$
a
$a/2$
$60°$
$\pi/3$
$(1+\epsilon)^{\alpha}$
$= 1 + \alpha\epsilon + \frac{\alpha(\alpha-1)}{2}\epsilon^2$
$+ \cdots$
$(1+\epsilon)^{\frac{1}{2}} = 1 + c_1\epsilon + c_2\epsilon^2$
$1 + c_1\epsilon + \cdots$
$\sin 30° = \sin\frac{\pi}{6} = \frac{1}{2} = \cos 60° = \cos\frac{\pi}{3}$
$\cos 30° = \cos\frac{\pi}{6} = \frac{\sqrt{3}}{2} = \sin 60° = \sin\frac{\pi}{3}$
$\sin\theta = \cos(\frac{\pi}{2} - \theta)$
$\cos\theta = \sin(\frac{\pi}{2} - \theta)$
$(1+\epsilon)^{\frac{1}{2}}(1+\epsilon)^{\frac{1}{2}} = 1 + 2c_1\epsilon + ?\epsilon^2 + \cdots$
$= 1 + \epsilon$
$\sin 45° = \sin\frac{\pi}{4} = \cos\frac{\pi}{4} = \cos 45° = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$
$\tan 45° = \tan\frac{\pi}{4} = 1$
$\sin x \simeq \tan x \simeq x$
x (in radians) $\ll 1$.
$\cos x = \sqrt{1 - \sin^2 x} \simeq \sqrt{1 - x^2}$
$\cos x \simeq 1 - \frac{x^2}{2}$
$\simeq 1 - \frac{x^2}{2} + \cdots$


c
a
θ
b
sin θ = a/c
cos θ = b/c
tan θ = a/b
P
h
Q
x
19°
47°
25°
120m
h/(x+120) = tan 19° = 0.3443
⇒ h = 0.3443(x+120)
h/x = tan 47° = 1.0724
sin(α+β) = AN = AT + TN
= AB cos α
sin β
sin α cos β + cos α sin β
NM = TB
= AB sin α
sin β
T
B
1
β
α
O
N
M
x
cos(α+β) = ON/OA = ON = OM − NM
= (cos α) OB
cos β
cos(α+β) = cos α cos β − sin α sin β


a
60°
π/3
a/2
(1 + ∈)^α
= 1 + α∈ + α(α−1)/2 ∈²
+ ...
sin 30° = sin π/6 = 1/2 = cos 60° = cos π/3
cos 30° = cos π/6 = √3/2 = sin 60° = sin π/3
sin θ = cos(π/2 − θ)
cos θ = sin(π/2 − θ)
(1+∈)^{1/2} = 1 + c1∈ + c2∈² + ...
c1² + 2c2 = 0
1 + c1∈ + ...
(1+∈)^{1/2}(1+∈)^{1/2} = 1 + 2c1∈ + ?∈² + ...
= 1 + ∈
sin(α ± β) = sinα cosβ ± cosα sinβ
cos(α ± β) = cosα cosβ ∓ sinα sinβ
sin(−β) = − sinβ
cos(−β) = cosβ
α =
sin x ≈ tan x ≈ x
x (in radians) << 1.
cos x = √(1 − sin²x) ≈ √(1 − x²)
cos x ≈ 1 − x²/2 ≈ 1 − x²/2 + ...

cos π/4 = √2/2 ⇒ cos π/8 = 1/2 √(2+2cos π/4) = 1/2 √(2+√2)
cos π/16 = 1/2 √(2+2cos π/8) = 1/2 √(2+√(2+√2))
cos π/32 = 1/2 √(2+2cos π/16) = 1/2 √(2+√(2+√(2+√2)))
cos(π/2^(n+1)) = 1/2 √(2+√(2+ ... √(2+√2)))
sin(α+β) = AN = AT + TN
= AB cos α
sin β
sin α cos β + cos α sin β
NM = TB
= AB sin α
sin β
cos(α+β) = ON/OA = ON = OM − NM
= cos α OB
cos β
cos(α+β) = cos α cos β − sin α sin β
O
N
M
x


$\sin(\alpha \pm \beta) = \sin\alpha \cos\beta \pm \cos\alpha \sin\beta$
$\cos(\alpha \pm \beta) = \cos\alpha \cos\beta \mp \sin\alpha \sin\beta$
$\sin(-\beta) = -\sin\beta$
$\cos(-\beta) = \cos\beta$
$\sin\alpha = 2\cos\frac{\alpha}{2}\sin\frac{\alpha}{2}$
$= 2^2\cos\frac{\alpha}{2}\cos\frac{\alpha}{4}\sin\frac{\alpha}{4}$
$= 2^3\cos\frac{\alpha}{2}\cos\frac{\alpha}{2^2}\cos\frac{\alpha}{2^3}\sin\frac{\alpha}{2^3}$
$\cdots$
$= 2^n\cos\frac{\alpha}{2}\cos\frac{\alpha}{2^2}\cos\frac{\alpha}{2^3}\cdots$
$\alpha = \frac{\pi}{2} \Rightarrow 1 = 2^n\cos\frac{\pi}{2^2}\cos\frac{\pi}{2^3}\cdots$