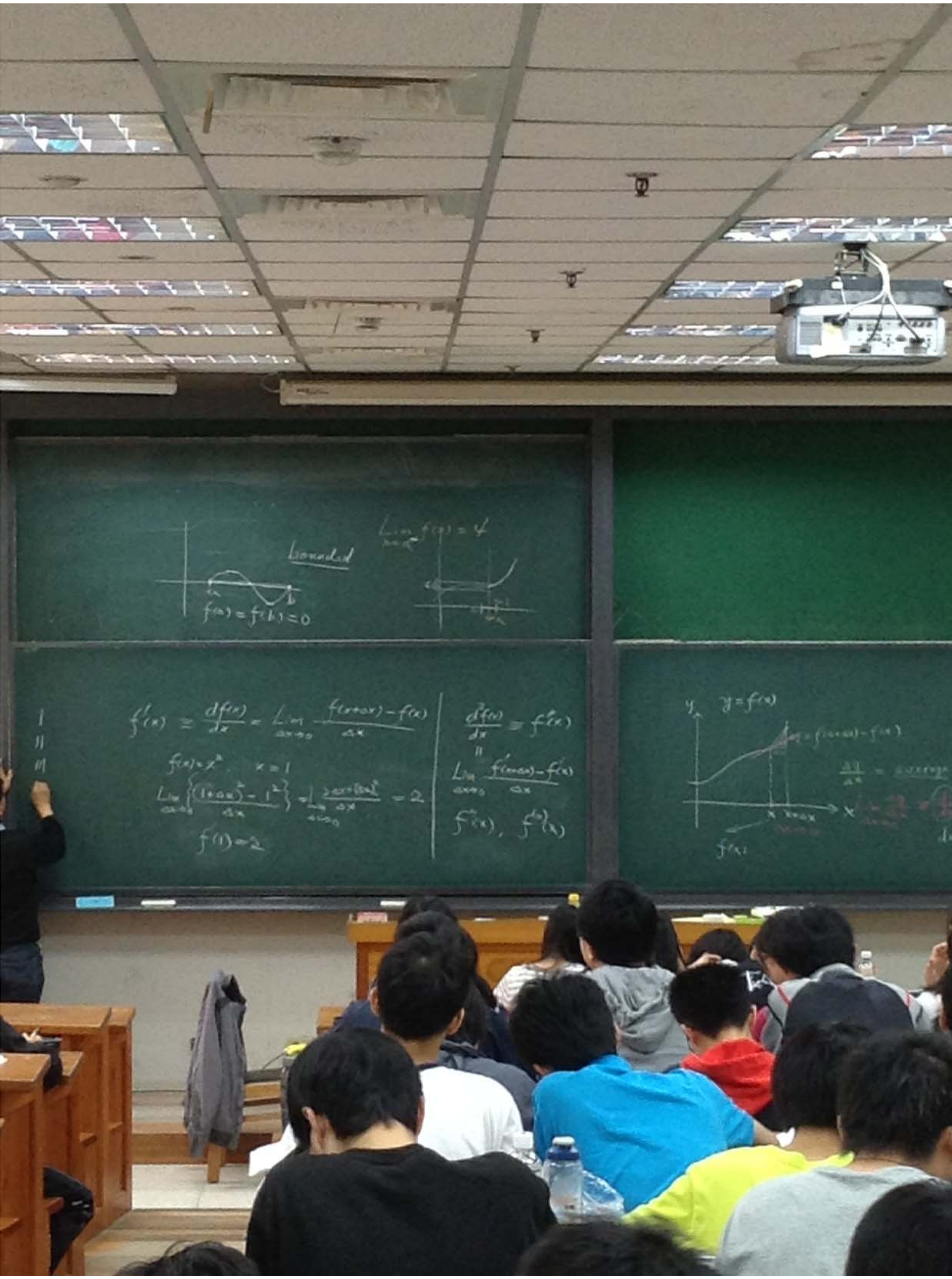
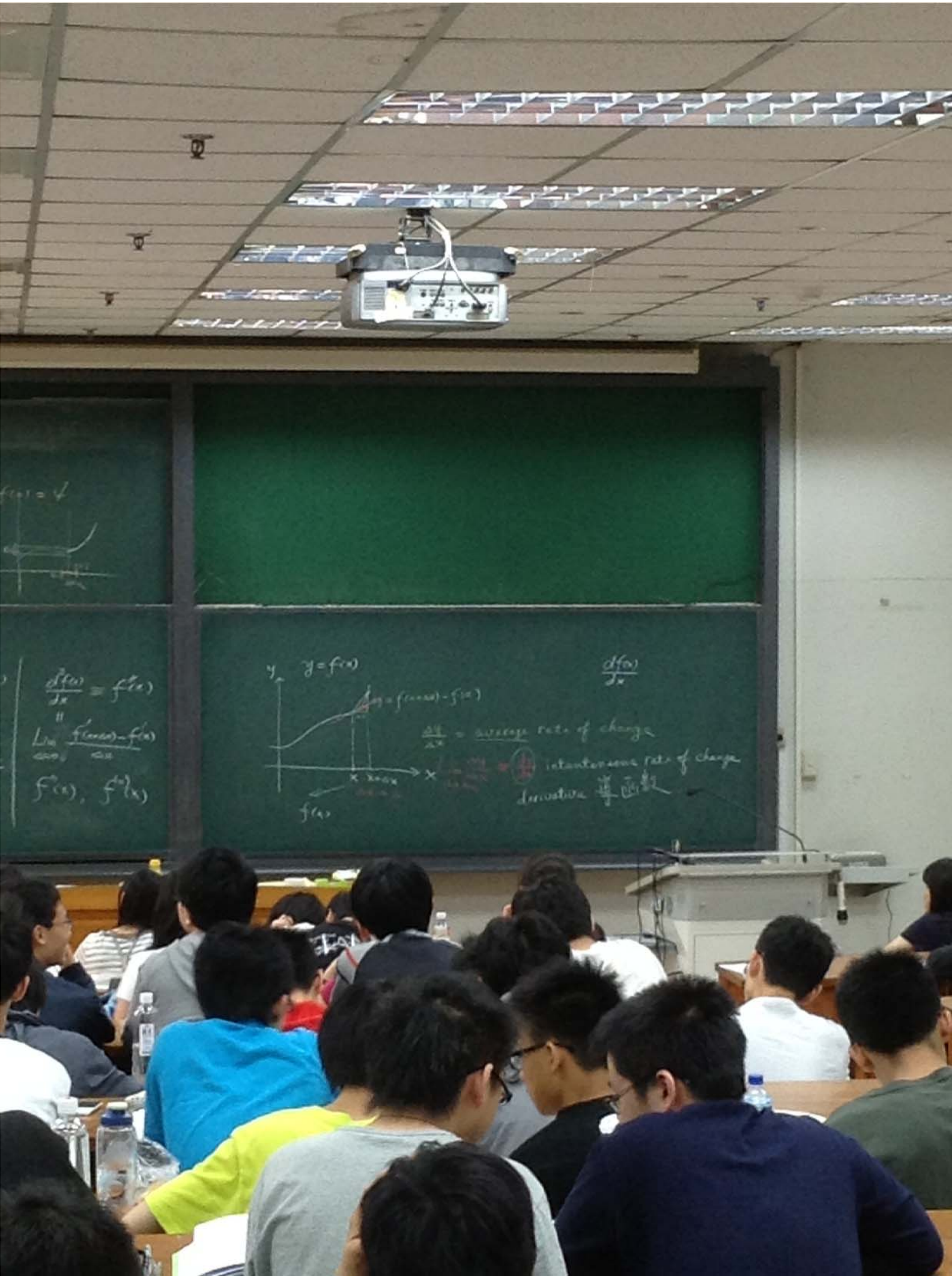
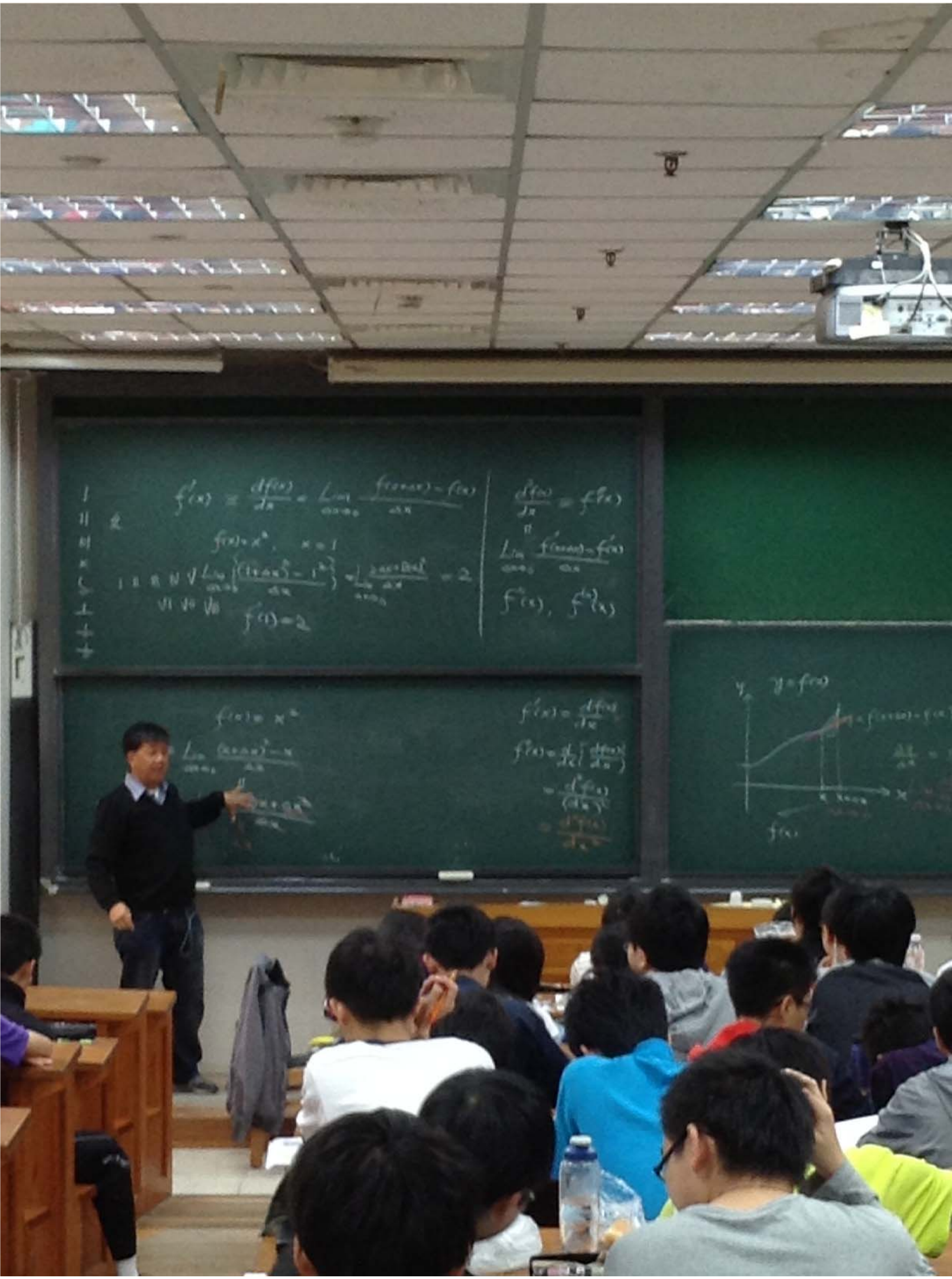
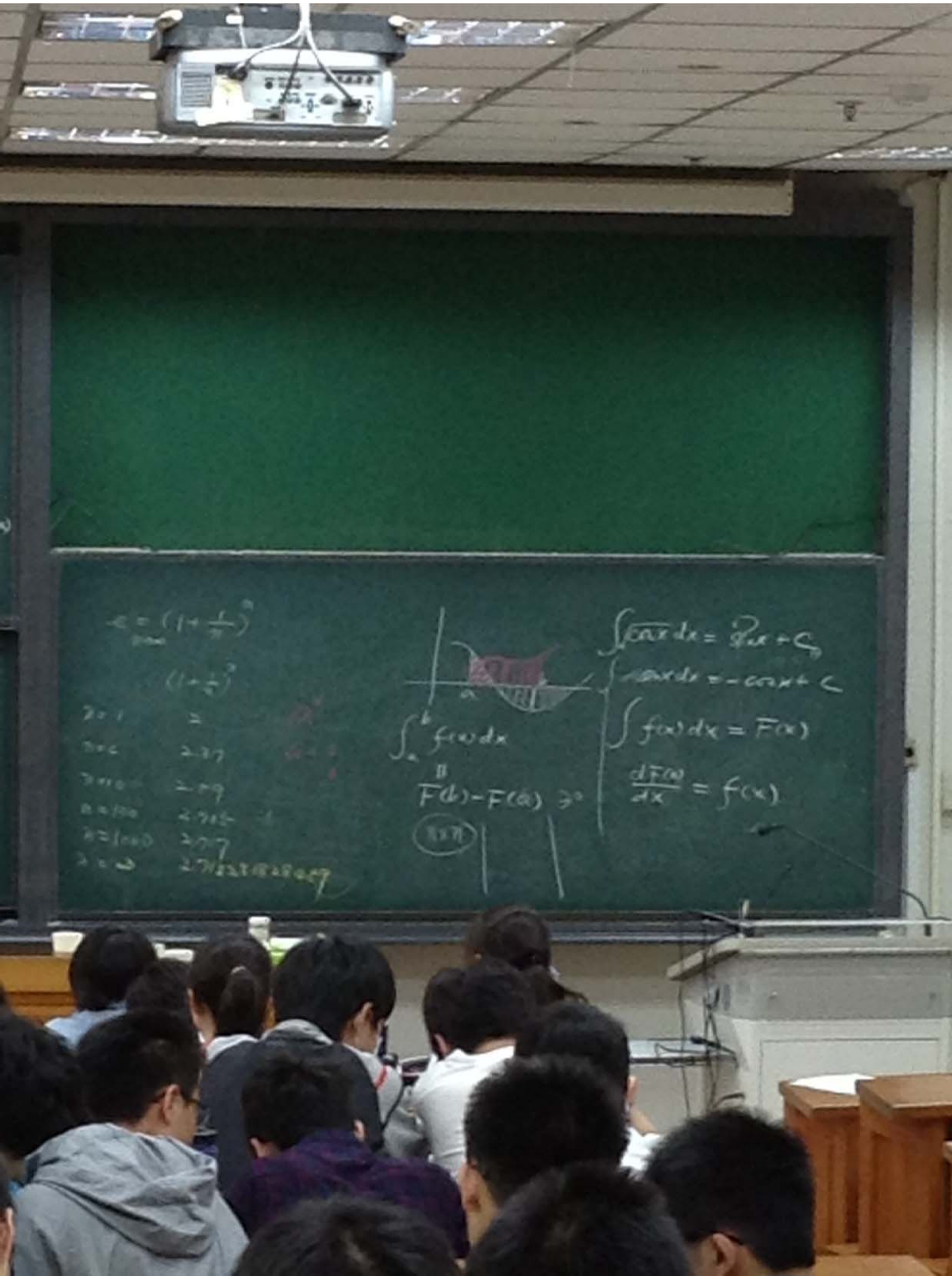
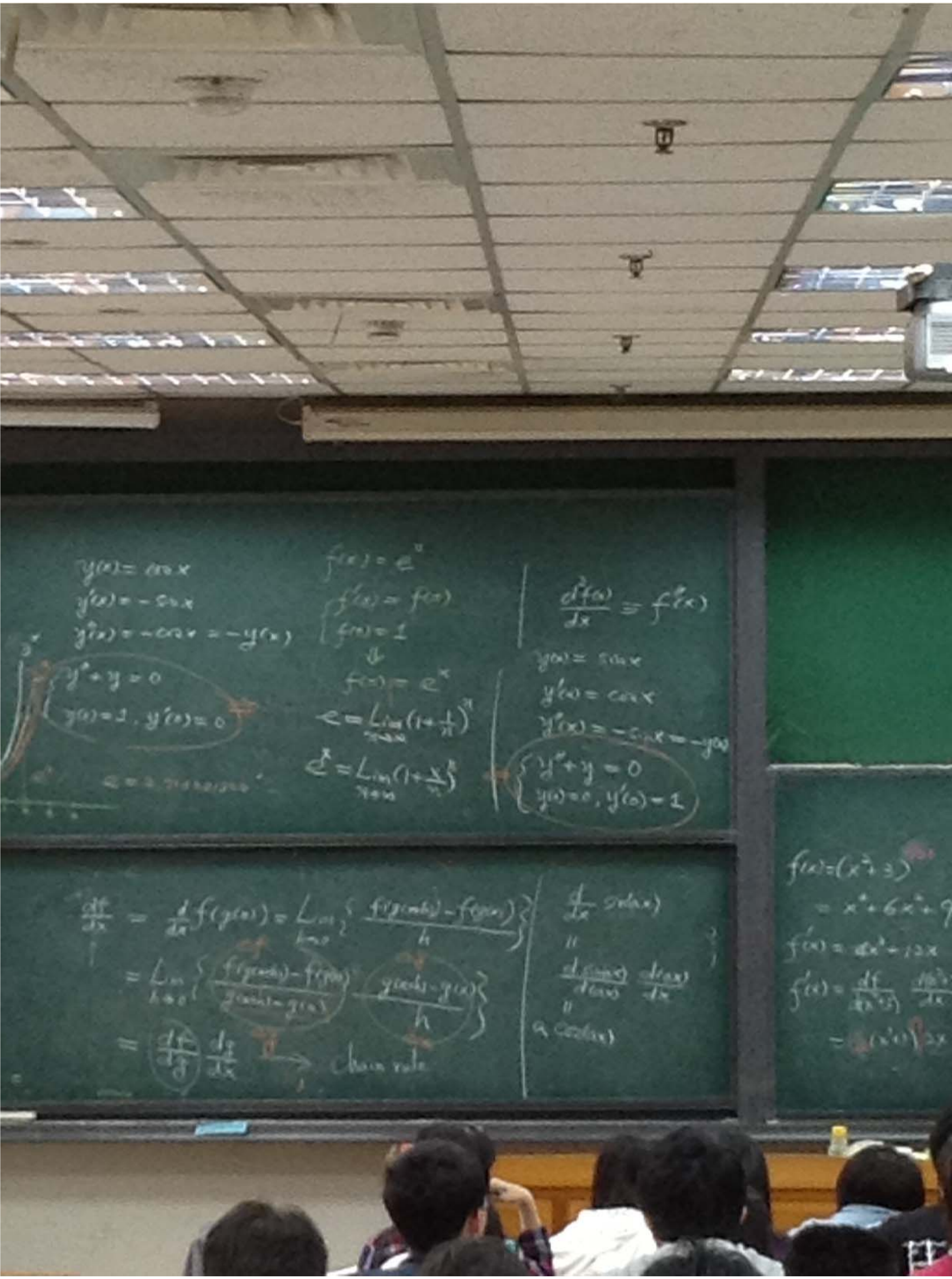

Bounded
f(a) = f(b) = 0
y = f(x)
f(x)=x²   x = 1
f(1) = 2

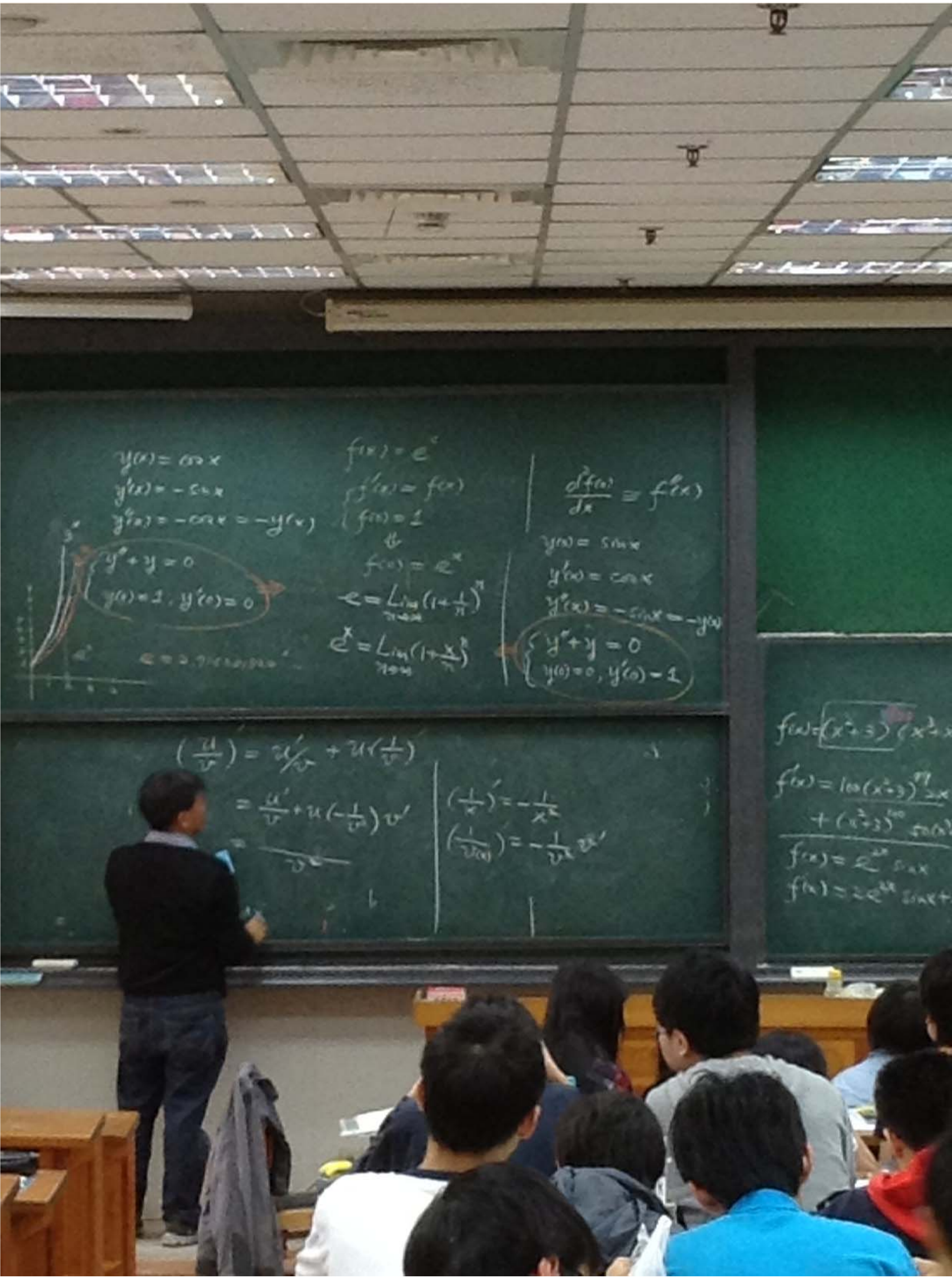

y = f(x)
df(x)/dx
rate of change
rate of change
derivative 導函數

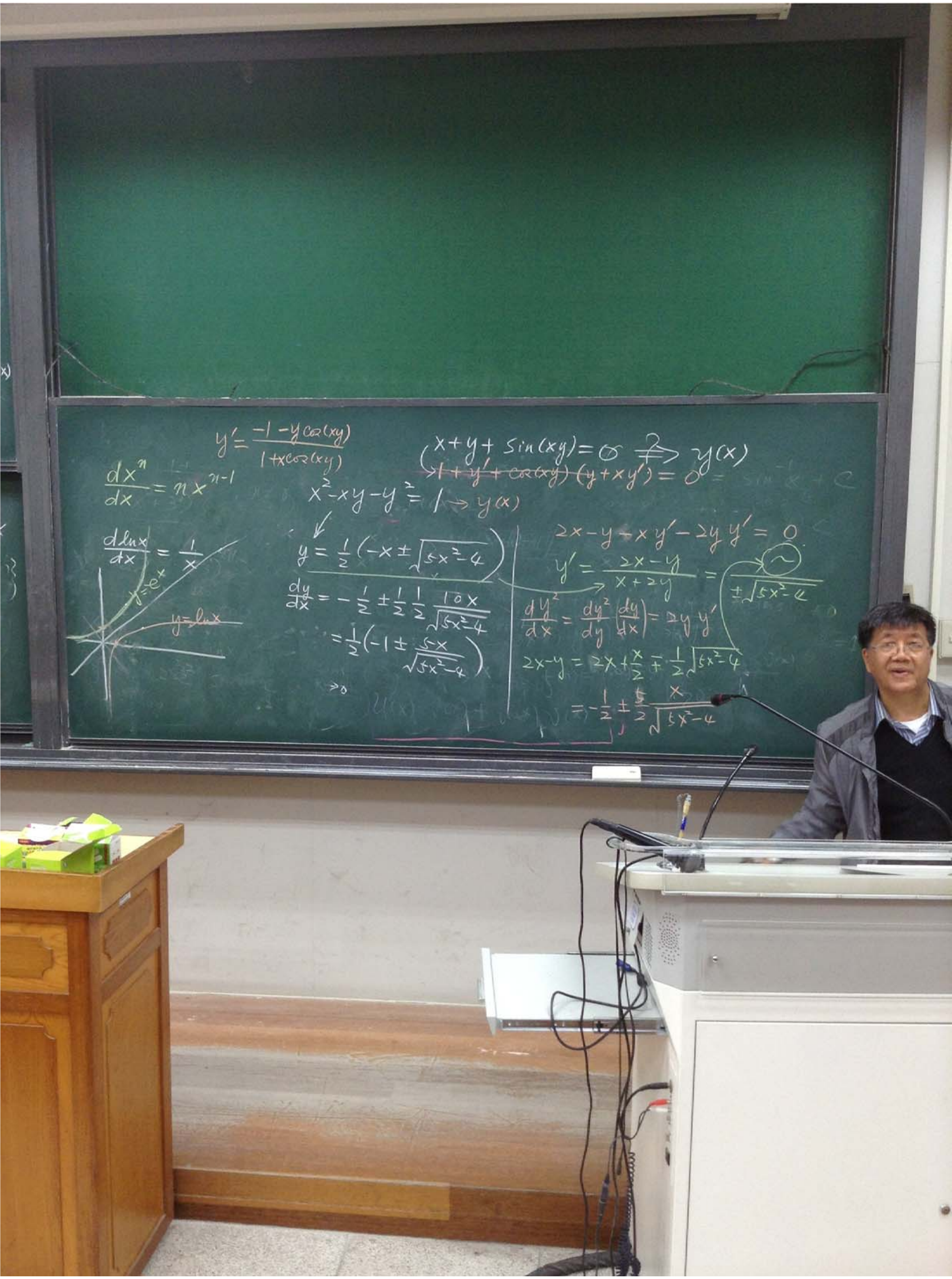


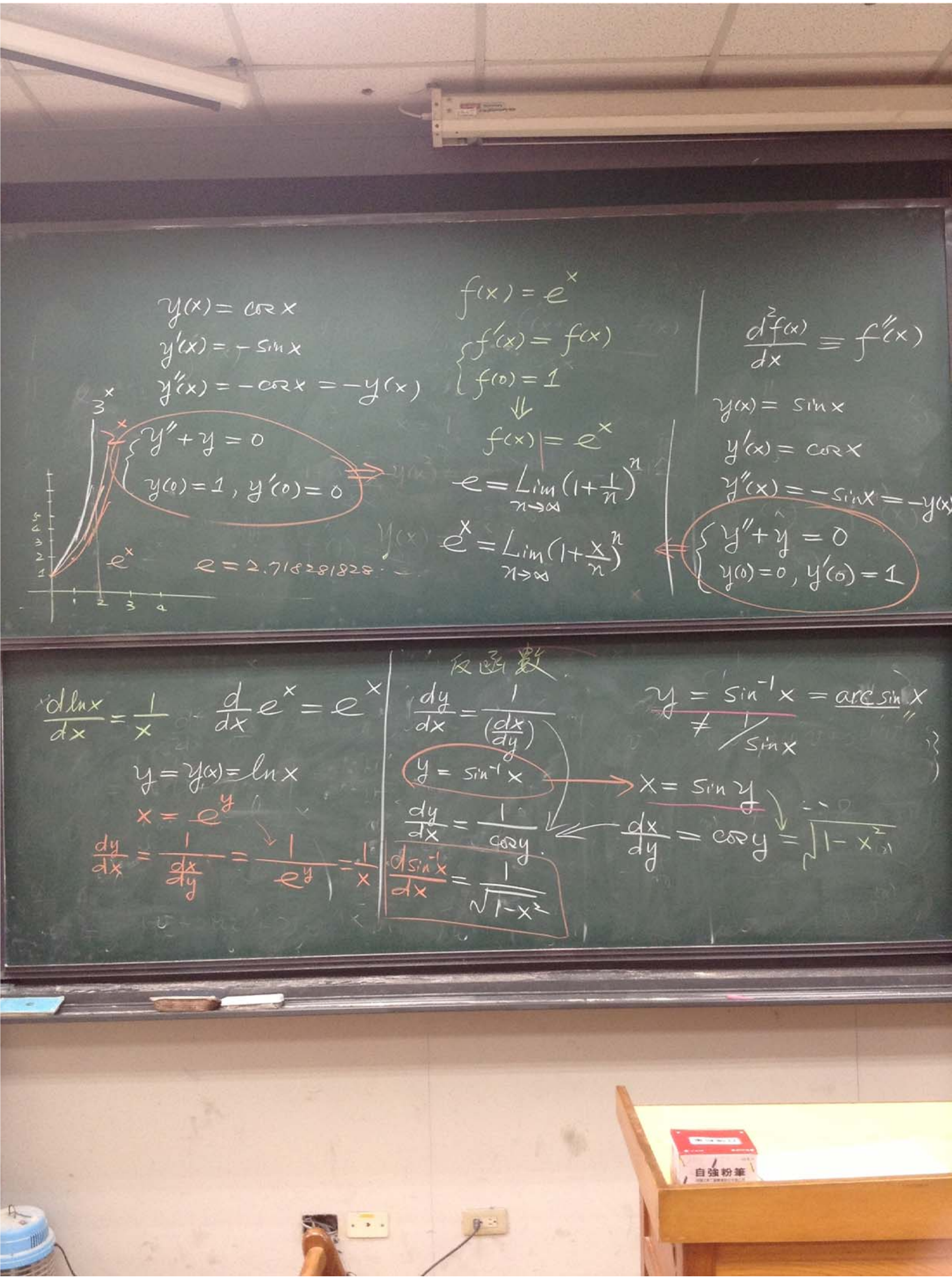


∫ f(x) dx = F(x)
dF(x)/dx = f(x)
F(b)−F(a)


y(x) = cos x
y'(x) = - sin x
y''(x) = - cos x = - y(x)
y'' + y = 0
y(0) = 1 , y'(0) = 0
f(x) = e^x
y(x) = sin x
y'(x) = cos x
y'' + y = 0
y(0) = 0 , y'(0) = 1
chain rule


y(x) = cos x
y'(x) = -sin x
y''(x) = -cos x = -y(x)
y'' + y = 0
y(0) = 1, y'(0) = 0
f'(x) = f(x)
f(0) = 1
e = Lim (1 + 1/n)^n
y(x) = sin x
y'(x) = cos x
y'' + y = 0
y(0) = 0, y'(0) = 1


y' = (-1 - y cos(xy)) / (1 + x cos(xy))
x + y + sin(xy) = 0 ⇒ y(x)
1 + y' + cos(xy) (y + xy') = 0
dx^n/dx = n x^{n-1}
x^2 - xy - y^2 = 1 → y(x)
d ln x/dx = 1/x
y = e^x
y = ln x
y = 1/2 (-x ± √(5x^2 - 4))
dy/dx = -1/2 ± 1/2 · 1/2 · 10x/√(5x^2 - 4)
= 1/2 (-1 ± 5x/√(5x^2 - 4))
2x - y - xy' - 2yy' = 0
y' = (2x - y)/(x + 2y)
dy^2/dx = dy^2/dy (dy/dx) = 2yy'
2x - y = 2x + x/2 ∓ 1/2 √(5x^2 - 4)
= -1/2 ± 5/2 · x/√(5x^2 - 4)


y(x) = cos x
y'(x) = − sin x
y''(x) = − cos x = − y(x)
y'' + y = 0
y(0) = 1 , y'(0) = 0
3^x
e^x
e = 2.718281828…
f(x) = e^x
f'(x) = f(x)
f(0) = 1
f(x) = e^x
e = Lim_{n→∞} (1 + 1/n)^n
e^x = Lim_{n→∞} (1 + x/n)^n
d²f(x)/dx² = f''(x)
y(x) = sin x
y'(x) = cos x
y''(x) = − sin x = − y(x)
y'' + y = 0
y(0) = 0 , y'(0) = 1
d ln x/dx = 1/x
d/dx e^x = e^x
y = y(x) = ln x
x = e^y
dy/dx = 1/(dx/dy) = 1/e^y = 1/x
反函數
dy/dx = 1/(dx/dy)
y = sin⁻¹ x = arc sin x
≠ 1/sin x
y = sin⁻¹ x
x = sin y
dy/dx = 1/cos y
dx/dy = cos y = √(1 − x²)
d sin⁻¹x/dx = 1/√(1 − x²)
自強粉筆