Brief solutions to selected problems in homework 11

1. Section 5.3: Solutions, common mistakes and corrections:

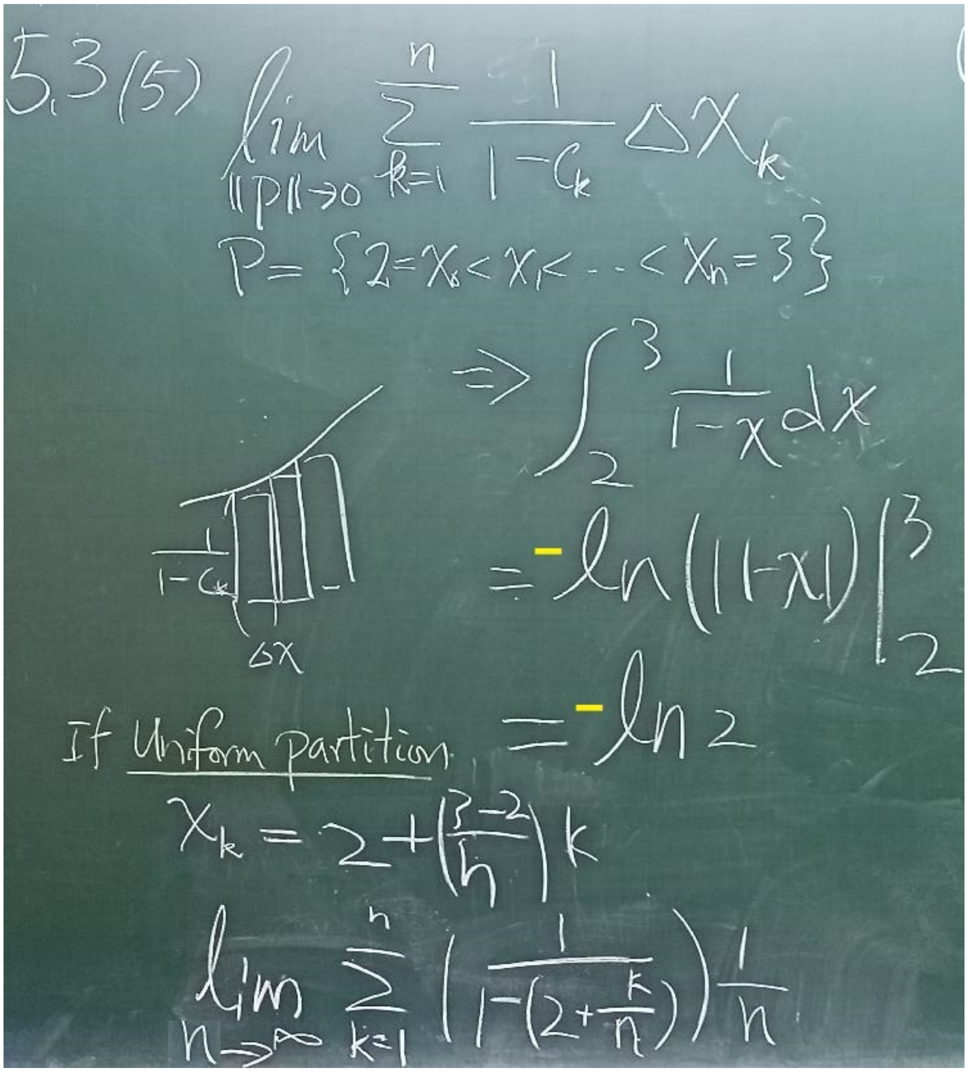

Figure 1: Solution to Section 5.3, problem 5

Correction for problem 5: $\int_2^3 \frac{1}{1-x} dx = -\int_2^3 \frac{1}{1-x} d(1-x) = -\ln(|1-x|)\Big|_2^3 = -\ln 2$

Problem 73: Since $\frac{1}{2} \leq \frac{1}{1+x^2} \leq 1$ on $[0,1]$, we know from Table 5.6, item 6 that

$$\frac{1}{2} \leq \int_0^1 \frac{1}{1+x^2} \leq 1$$

2. Section 5.4: Solutions, common mistakes and corrections:

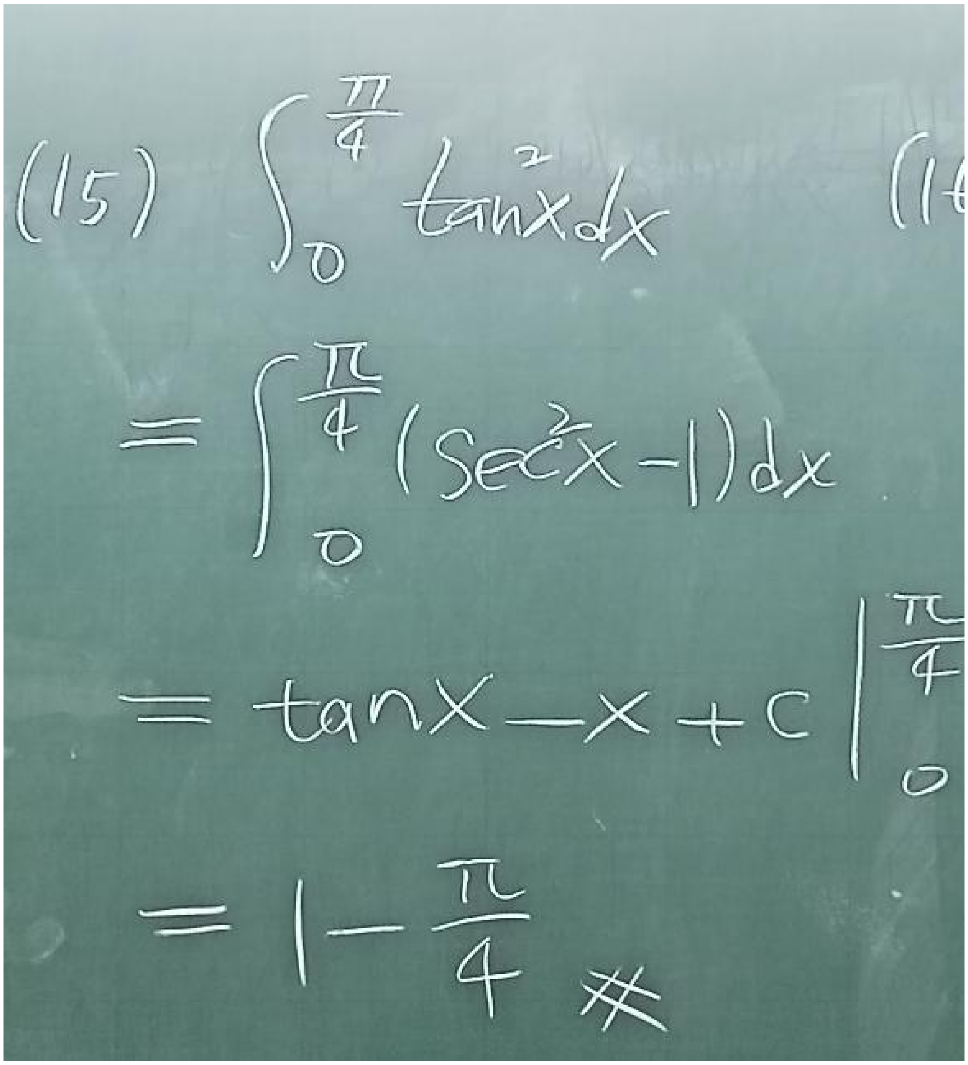

Figure 2: Solution to Section 5.4, problem 15

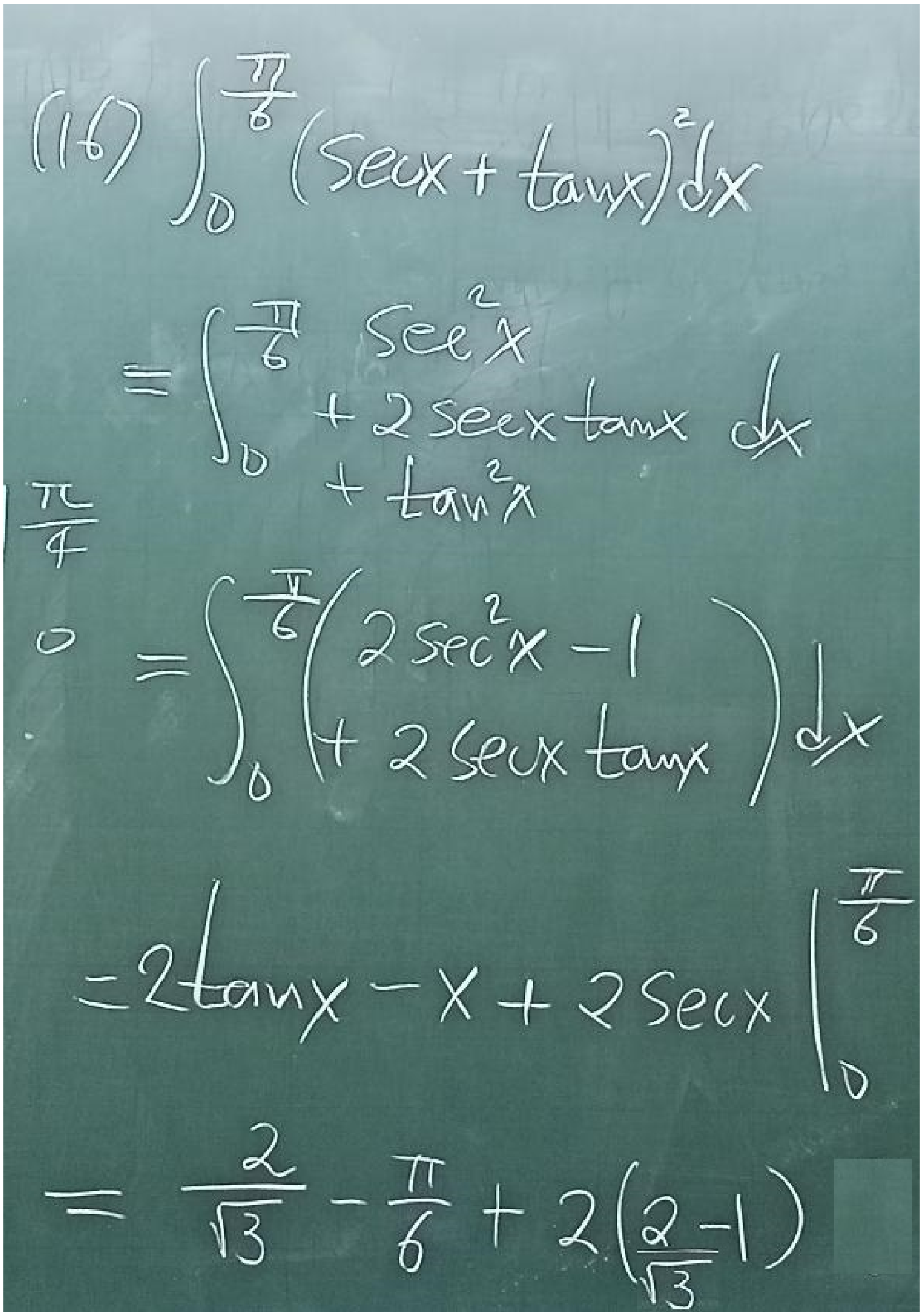

Figure 3: Solution to Section 5.4, problem 16

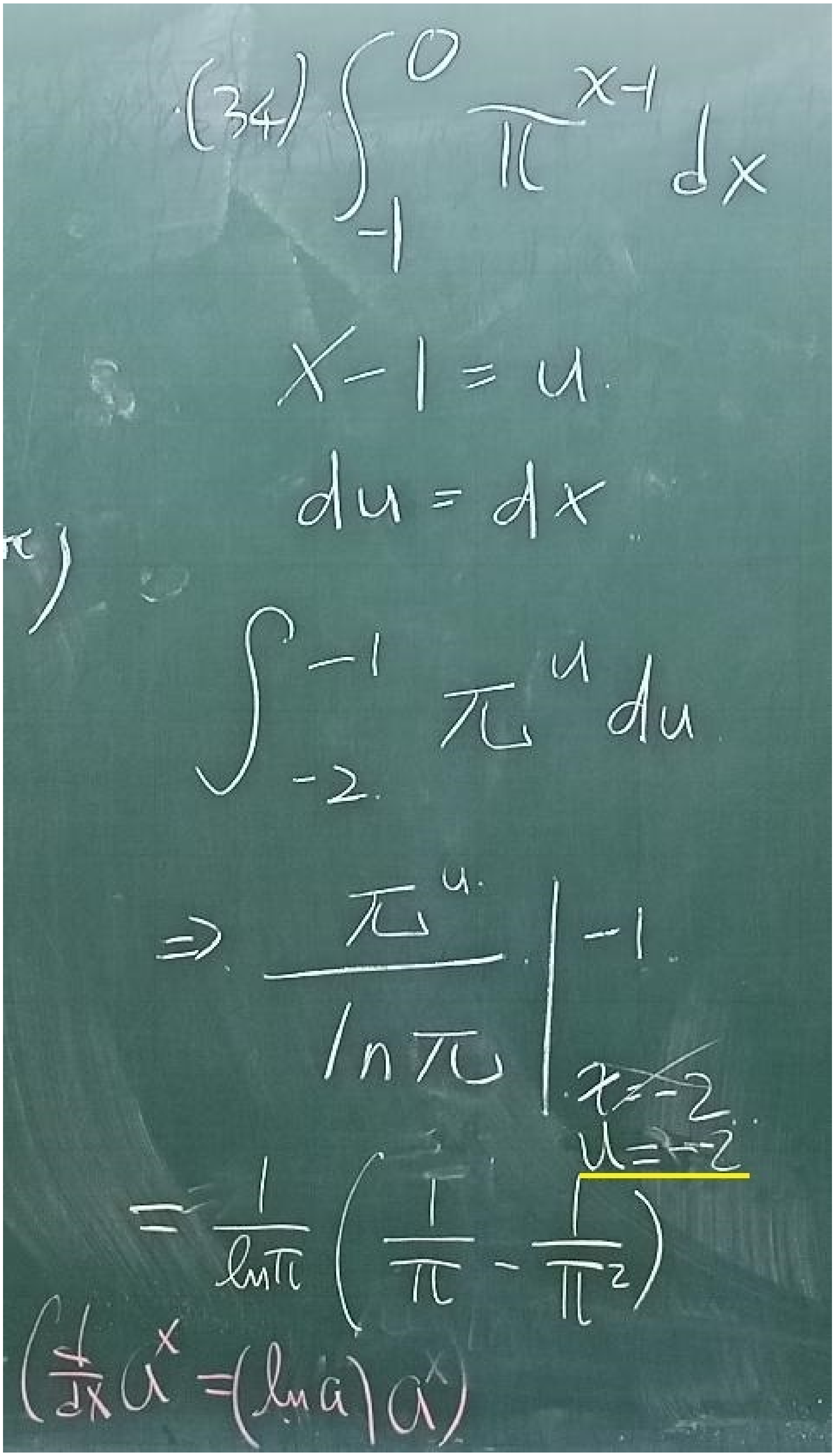

Figure 4: Solution to Section 5.4, problem 34

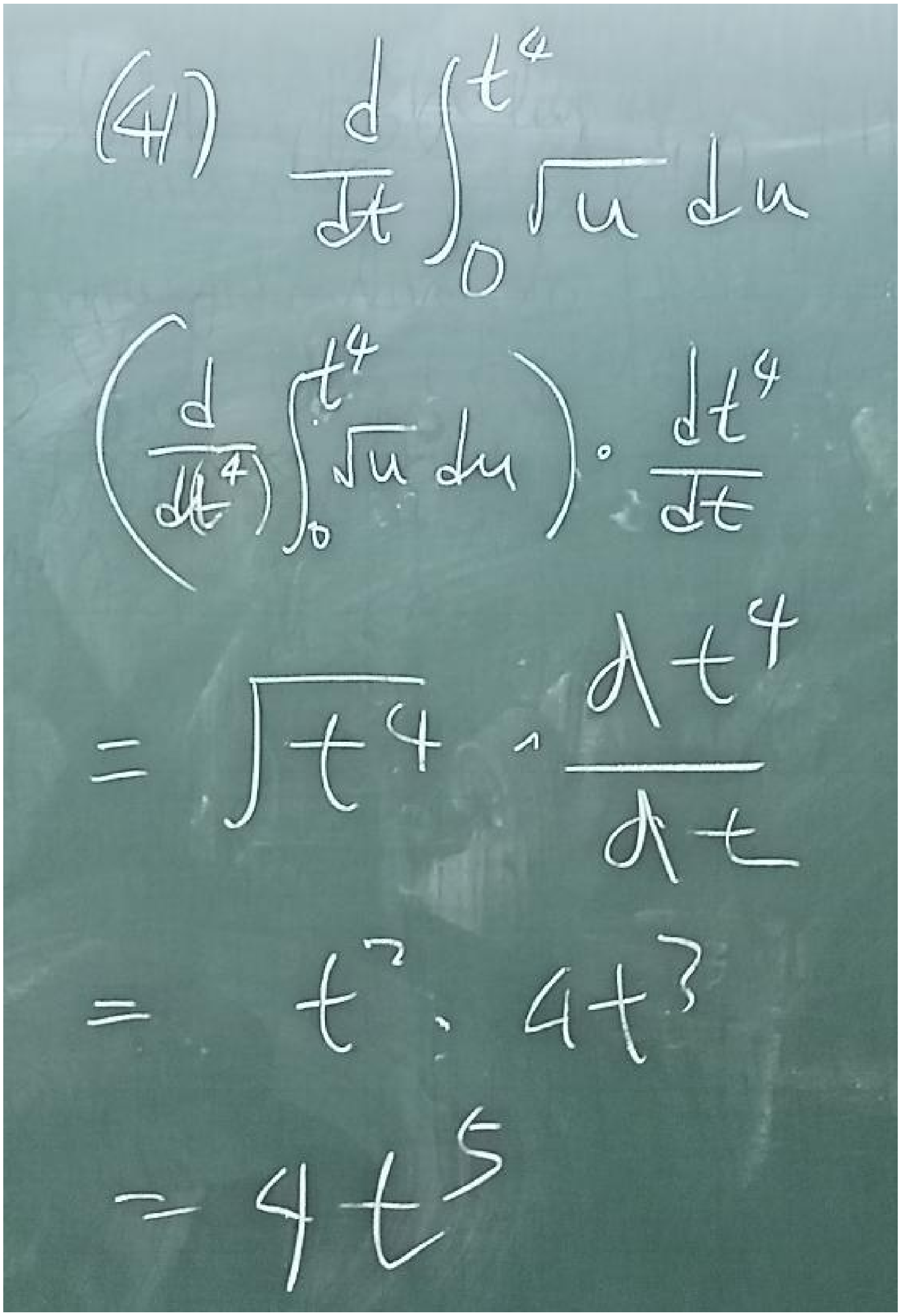

Figure 5: Solution to Section 5.4, problem 41

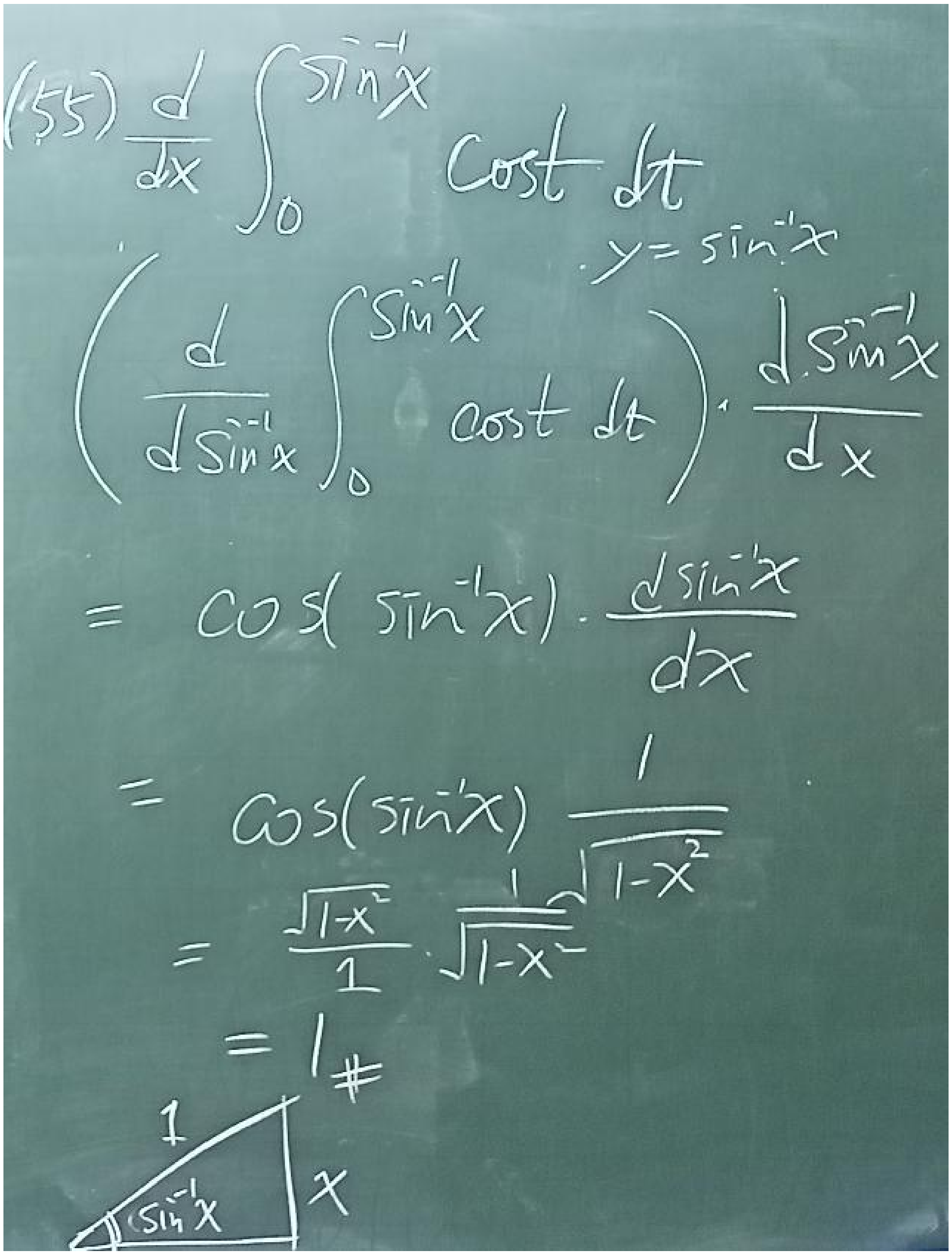

Figure 6: Solution to Section 5.4, problem 55

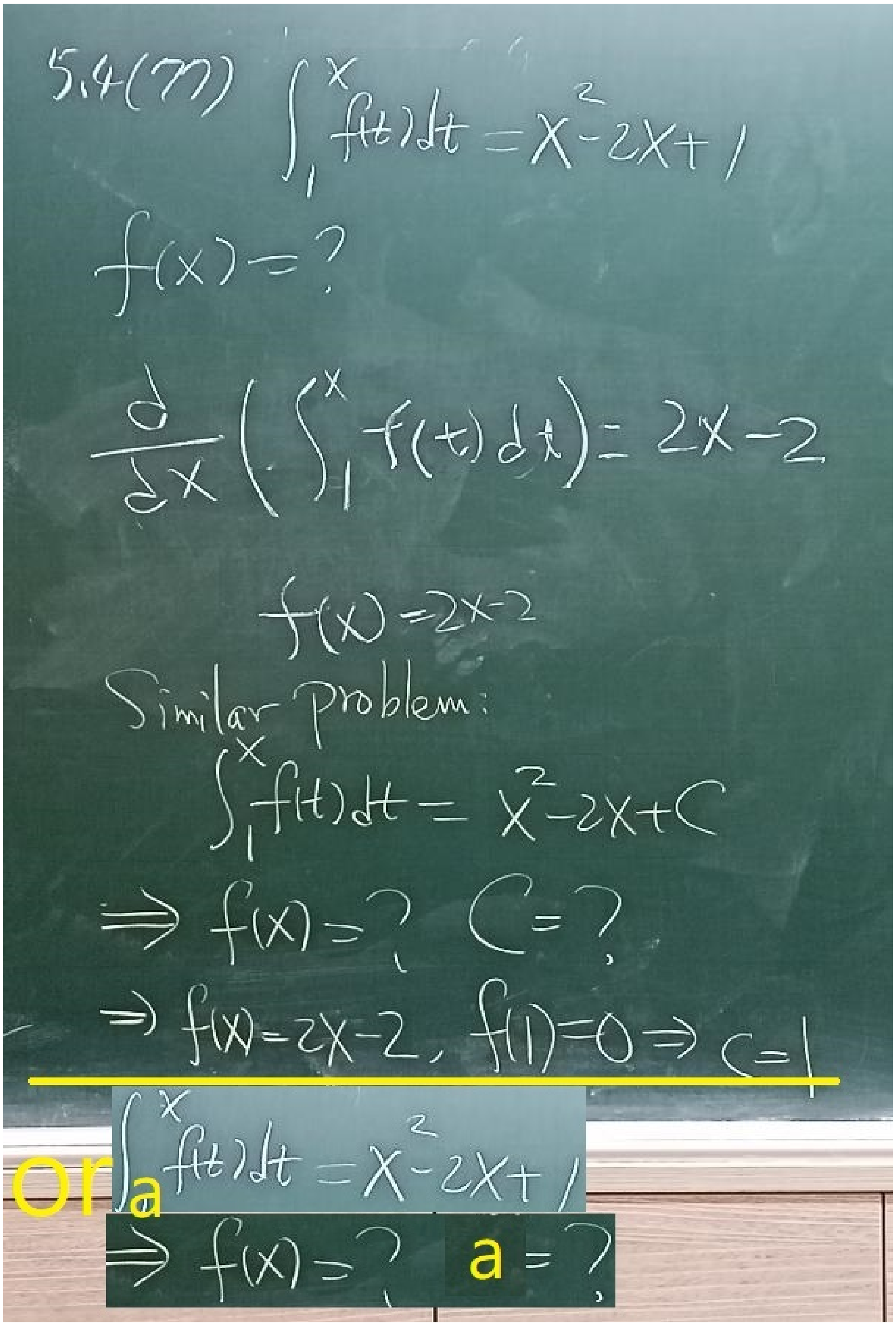

Figure 7: Solution to Section 5.4, problem 77

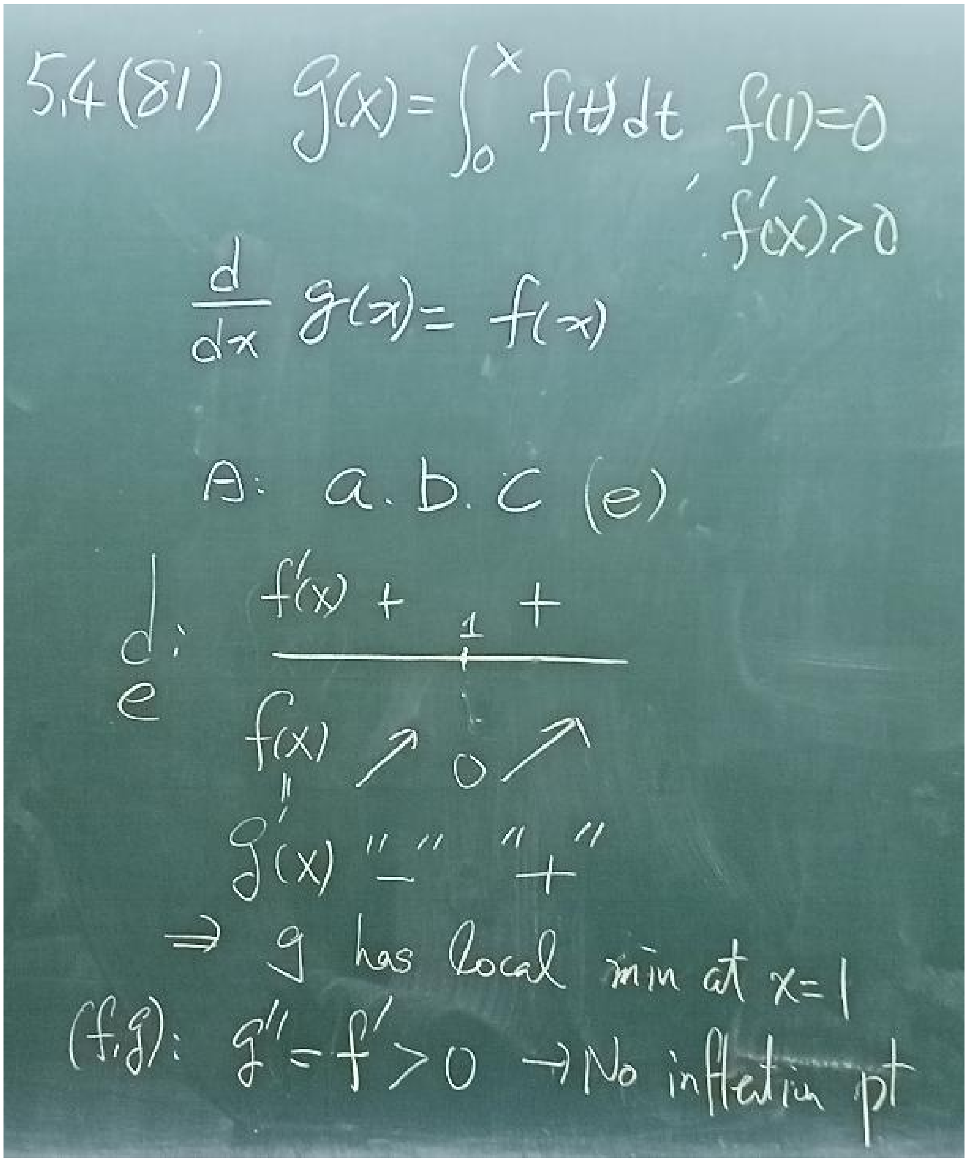

Figure 8: Solution to Section 5.4, problem 81

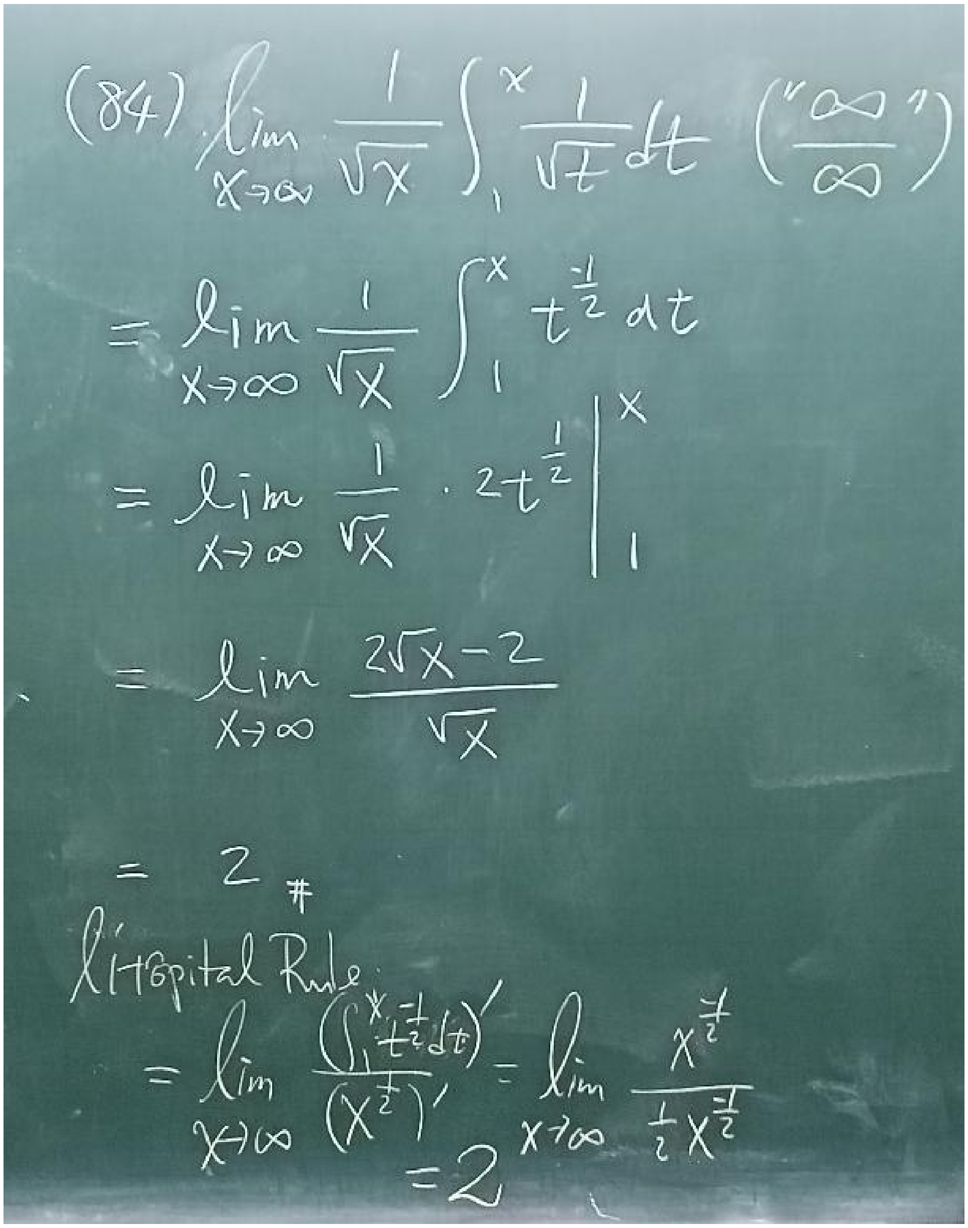

Figure 9: Solution to Section 5.4, problem 84

Remark: L'Hôpital's Rule can be used in cases where the antiderivative is not known, for eample:

$$\lim_{x\to\infty} \frac{1}{\sqrt{x}} \int_1^x \frac{1}{\sqrt{t+\sin t}} dx$$

3. Chapter 5, additional and advanced problems: Solutions, common mistakes and corrections:

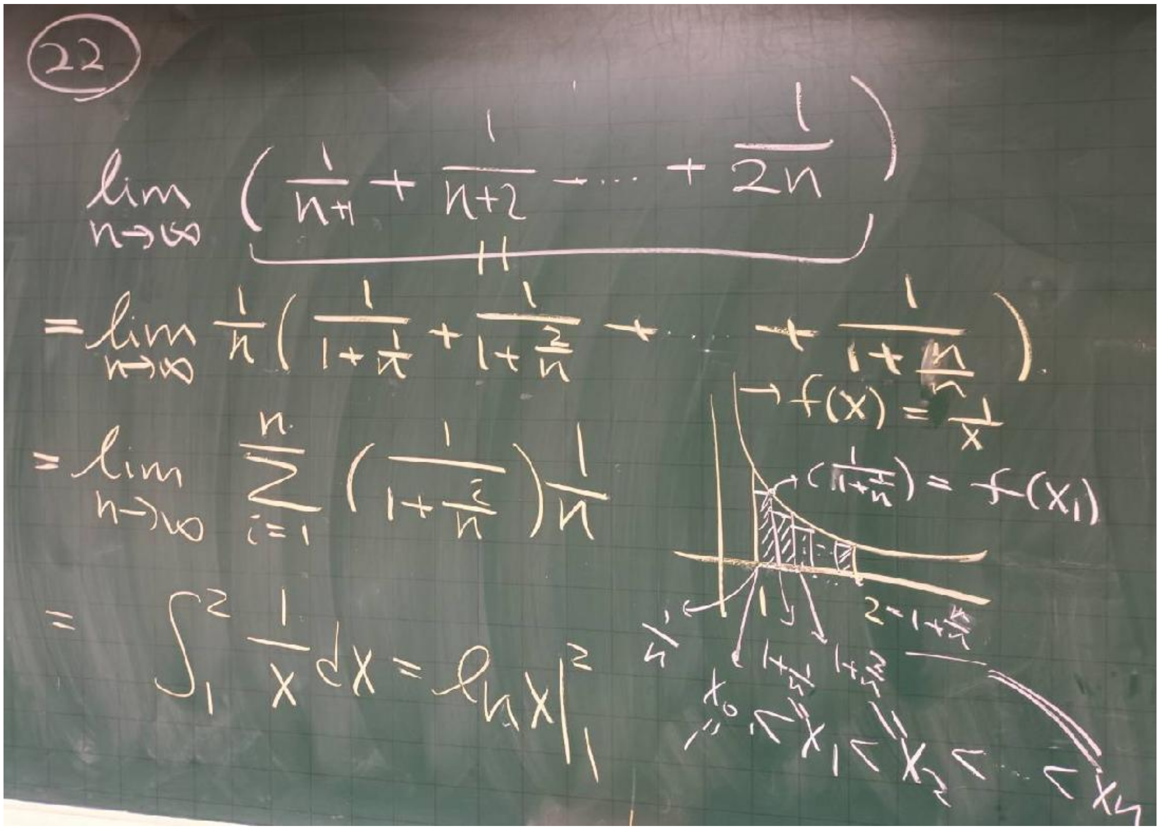

Figure 10: Solution to Chapter 5, additional and advanced problems: problem 21