

$$\sin^2 x \, d(\cos^2 x)$$

$$\int \sin^2 x \, d(\cos^2 x)$$

$$\int \sin^2 x \, 2 \cos x (-\sin x) \, dx$$

$$= -2 \int \sin^3 x \cos x \, dx, u = \sin x$$

$$= -2 \frac{\sin^4 x}{4} + c$$

7.

$$\int 3x^3 \, d(\ln x) = \int 3x^3 \frac{1}{x} \, dx = 3 \frac{x^3}{3} + c$$

integrali aşağıdakilerden hangisine eşittir?

A) $3x^2 + c$

B) $3x^3 + c$

☒ C) $x^3 + c$

D) $x^2 + c$

E) $2x^3 + c$

4. $\int \frac{\sqrt{x}}{\sqrt{x}+1} dx$ integralinde $t = \sqrt{x}$ dönüşümü yapılırsa aşağıdakilerden hangisi elde edilir?

- A) $\int \frac{2t}{t+1} dt$ B) $\int \frac{t}{t+1} dt$ C) $\int \frac{2t^2}{t+1} dt$ D) $\int \frac{t^2}{t+1} dt$ E) $\int \frac{2t^2}{t^2+1} dt$

8.

$$x = t^2$$

$$dx = 2t dt$$

$$\int \frac{t}{t+1} \cdot 2t dt$$

$$x = e^u$$

$$\int \ln(\ln x) dx$$

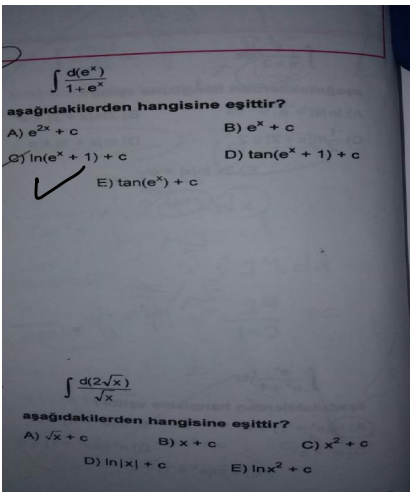
$$\ln x = u$$

$$\int \ln(u) e^u du$$

$$\frac{dx}{e^u} = du$$

10. $\int \ln(\ln x) dx$ integralinde $\ln x = u$ dönüşümü yapılırsa aşağıdakilerden hangisine eşit olur?

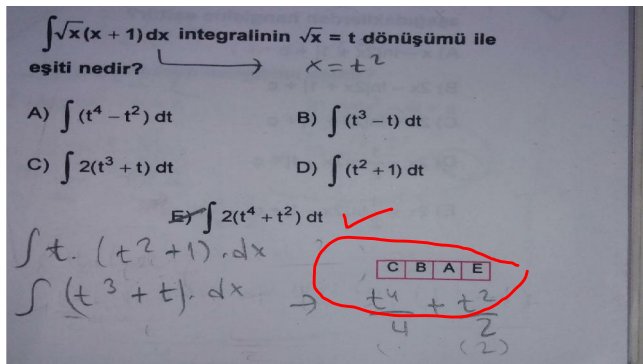
- A) $\int e^u \ln u du$ B) $\int e^u du$ C) $\int \ln u du$ D) $\int u du$ E) $\int u \ln u du$



$$\int \frac{d(e^x)}{1+e^x} = \int \frac{e^x dx}{1+e^x} = \ln(e^x + 1) + c$$

$$\int \frac{d(2\sqrt{x})}{\sqrt{x}} = \int \frac{1}{\sqrt{x}} dx$$

$$= \int \frac{dx}{x} = \ln x + c$$



$$\sqrt{x} = t$$

$$x = t^2$$

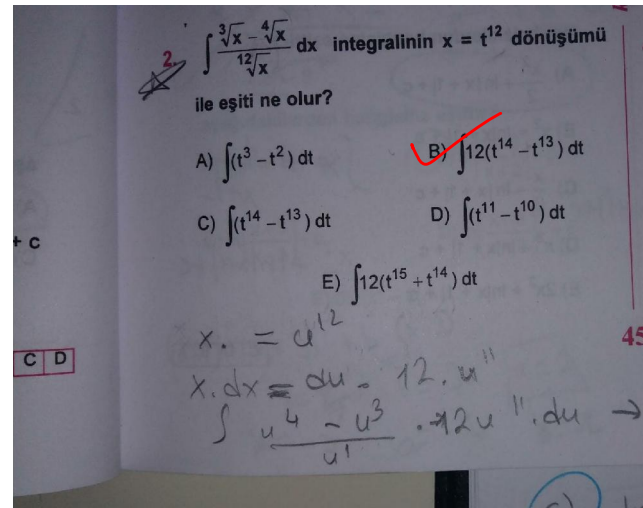
$$dx = 2t dt$$

$$\int t(t^2 + 1) 2t dt$$

$$x = t^{12}$$

$$dx = 12t^{11} dt$$

$$\int \frac{t^4 - t^3}{t^{10}} 12 t^{10} dt$$



$$\int \frac{(x-1)^2}{x^2 - 2x - 1} dx$$

$$= \int \frac{dx}{1+x^2} = \arctan x + c$$

$$\int \frac{x^2 + x}{x-1} dx$$

$$= \int \left(x + 2 + \frac{2}{x-1} \right) dx$$

$$\begin{array}{r} x^2 + x \\ -x^2 + x \\ \hline 2x \\ -2x + 2 \\ \hline 2 \end{array} \left| \frac{x-1}{x+2} \right. = \frac{x^2}{2} + 2x + 2 \ln|x-1| + c \checkmark$$

$$\textcircled{1} \int \sqrt{9-x^2} dx \quad \text{Binom integral} \quad b.m+p.n-a=?$$

$$\int x^m \cdot (9-x^2)^{1/2} dx \quad \int x^m (a+bx^n)^p dx$$

$\downarrow a \quad \downarrow n \quad \downarrow p \quad b=-1$

$$\textcircled{2} \int (\ln x + x^{-1}) e^x dx \quad ?$$

$$\int (e^x \cdot \ln x)' dx = e^x \cdot \ln x + c$$

$$\textcircled{3} \int 2 \sin(2x) \sin(3x) dx$$

ters dönüşüm formülü uygulanır

$$\textcircled{4} \int \sqrt{9-x^2} dx = \theta(x) \sqrt{9-x^2} + \lambda \int \frac{dx}{f(x)}$$

$$\int 2 \cdot \left(-\frac{1}{2} (\cos 5x - \cos x) \right) dx$$

$$= \sin x - \frac{\sin 5x}{5} + c$$

$$\int \frac{P_2(x)}{\sqrt{9-x^2}} dx = \frac{\theta(x)}{(Ax+B)\sqrt{9-x^2}} + \lambda \int \frac{dx}{\sqrt{9-x^2}}$$

Türev Alınır

$$\int \frac{dx}{\cos^2(\frac{3x}{3})} = \frac{1}{3} \tan(3x) + c$$

$$\int \ln^2 x dx$$

$$\ln x = u \quad x = e^u$$

$$dx = e^u du$$

$$\int u^2 e^u du = u^2 e^u - 2u e^u + 2e^u + c$$

$$+ \frac{1}{u^2} \quad \frac{1}{e^u} = \ln^2 x \cdot x - 2 \ln x \cdot x + 2x + c$$

$$- 2u \quad \rightarrow \quad e^u$$

$$+ 2 \quad \rightarrow \quad e^u$$

(b) Use partial fractions to find

$$\int \frac{12x^2 + 2x + 3}{x(1 + 4x^2)} dx \Rightarrow \frac{12x^2 + 2x + 3}{x(1 + 4x^2)} = \frac{\Delta}{x} + \frac{Bx + C}{1 + 4x^2}$$

$$12x^2 + 2x + 3 = A + 4Ax^2 + 3x^2 + Cx$$

$$A + B = 12 \quad C = 2$$

3 0

$$\int \frac{3dx}{x} + \int \frac{2dx}{1 + \underbrace{4x^2}_{(\frac{2x}{1})^2}} = 3\ln x + \arctan(2x) + c$$

$$\int \sqrt{\frac{2+3\sqrt{x}}{x^3}}$$

$$\int x^{-3} (\underbrace{2+3x^{1/2}}_{u^2})^{1/2} dx$$

$$p = \frac{1}{2} \notin \mathbb{Z}$$

$$\frac{m+1}{n} = \frac{-3+1}{\frac{1}{2}} = -4 \in \mathbb{Z} \checkmark$$

$$\int \frac{dx}{x \sqrt{1 - \ln x}} = \int \frac{du}{\sqrt{1 - u^2}}$$

$$= \arcsin(u) + C$$

$$= \arcsin(\ln x) + C$$

$$u = \ln x$$

$$du = \frac{dx}{x}$$

$$\int \tan x \ln(\cos x) dx = \int -u du$$

$$dL = \frac{-\sin x}{\cos x} dx = -\frac{u^2}{2} + C$$

