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

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

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

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

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

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

integrali aşağıdakilerden hangisine eşittir?

A) $3x^2 + c$ B) $3x^3 + c$ C) $x^3 + c$ ✓

D) $x^2 + c$ E) $2x^3 + c$

10.

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.

55

$x = t^2$

$dx = 2t\,dt$

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

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) $\int u \ln u\,du$

$x = e^u$

$\ln x = u$

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

e^u

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

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

$\int \frac{d(e^x)}{1+e^x}$

aşağıdakilerden hangisine eşittir?

A) $e^{2x} + c$ B) $e^x + c$

C) $\ln(e^x + 1) + c$ D) $\tan(e^x + 1) + c$

E) $\tan(e^x) + c$

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

aşağıdakilerden hangisine eşittir?

A) $\sqrt{x} + c$ B) $x + c$ C) $x^2 + c$

D) $\ln|x| + c$ E) $\ln x^2 + c$

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

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

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

$\int \sqrt{x}(x+1)\,dx$ integralinin $\sqrt{x}=t$ dönüşümü ile eşiti nedir? $\longrightarrow x=t^2$

A) $\int (t^4-t^2)\,dt$

B) $\int (t^3-t)\,dt$

C) $\int 2(t^3+t)\,dt$

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

E) $\int 2(t^4+t^2)\,dt$

$\int t.(t^2+1).dx$

$\int (t^3+t).dx \rightarrow \frac{t^4}{4}+\frac{t^2}{2}$ (2)

C	B	A	E

$\sqrt{x}=t$

$x=t^2$

$dx=2t\,dt$

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

2\. $\int \frac{\sqrt[3]{x}-\sqrt[4]{x}}{\sqrt[12]{x}}\,dx$ integralinin $x=t^{12}$ dönüşümü ile eşiti ne olur?

A) $\int (t^3-t^2)\,dt$

B) $\int 12(t^{14}-t^{13})\,dt$

C) $\int (t^{14}-t^{13})\,dt$

D) $\int (t^{11}-t^{10})\,dt$

E) $\int 12(t^{15}+t^{14})\,dt$

$x. = u^{12}$

$x.dx = du . 12.u^{11}$

$\int \frac{u^4-u^3}{u^1}.12u^{11}.du \rightarrow$

+ C

C	D

45

$x=t^{12}$

$dx=12t^{11}dx$

$\int \frac{t^4-t^3}{\cancel{t}}\,12\,\cancel{t^{11}}\,t^{10}\,dt$

$$\int \frac{\cancel{(x-1)^2}}{\cancel{(x-1)^2}.(x^2+1)}\,dx = \int \frac{dx}{1+x^2} = \arctan x + c$$

(x^2-2x-1)

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

$x^2+x \;|\; x-1$

$-x^2 \pm x \;|\; x+2$

$2x$

$-2x \pm 2$

2

$$= \frac{x^2}{2}+2x+2\ln|x-1|+c$$

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

$\int \underset{a}{x^{\overset{m}{0}}} . (9-\underset{n}{x^2})^{\overset{p}{1/2}}$ $\qquad \int x^m (a+bx^n)^p\,dx$ $\qquad b=-1$

② $\int (\ln x + x^{-1}) e^x\,dx$?

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

③ $\int 2\sin(2x)\sin(3x)\,dx$

ters dönüşüm formülü uygulanır

④ $\int \sqrt{9-x^2}\,dx = Q_1(x)\sqrt{9-x^2} + \lambda \int \frac{dx}{f(x)}$

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

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

$$\int \frac{\overset{P_2(x)}{9-x^2}}{\sqrt{9-x^2}}\,dx = \overset{Q_1(x)}{(Ax+B)}\sqrt{9-x^2} + \lambda \int \frac{dx}{\sqrt{9-x^2}}$$

Türev Alınır

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

$$\int \ln^2 x\,dx \qquad \ln x = u \qquad x = e^u$$
$$dx = e^u du$$

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

I	$\int$
$+\ u^2$	e^u
$-\ 2u$	e^u
$+\ 2$	e^u

$$= \ln^2 x . x - 2\ln x . x + 2x + c$$

$0 \searrow e^4$

(b) Use partial fractions to find

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

$A=3$

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

$4A+B=12$

$3 \quad 0$

$C=2$

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

$u = 2x$

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

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

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

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

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

$u=\ln x$

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

$= \arcsin(u)+c$

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

$$\int \tan x \underbrace{\ln(\cos x)}_{u} dx = \int -u\,du$$

$$du = \frac{-\sin x}{\cos x} dx \qquad = -\frac{u^2}{2} + c$$

$$\int \frac{\sqrt[2]{x} + \sqrt[3]{x}}{12\sqrt[4]{x}} \cdot dx$$

Kök içi aynı ✓

okek $(2,3,4) = 12$

$x = u^{12}$ den çözülür.