

## ÖZEL DÖNÜŞÜMLER

1. Aşağıdaki integrallerin yanında verilen değişken değiştirmesi yapılıncaya hangi integral elde edilir.

a)  $\int_0^1 \sqrt{1-x^2} dx$  integralinde  $x=\sin t$

Cevap:  $\int_0^{\frac{\pi}{2}} \cos^2 t dt$

b)  $\int_0^{\ln 4} \frac{1}{e^x+1} dx$  integralinde  $e^x+1=t$

Cevap:  $\int_2^5 \frac{dt}{t^2-t}$

c)  $\int_1^2 e^{3x+1} \cdot dx$  integralinde  $3x+1=t$

Cevap:  $\int_4^7 \frac{e^t dt}{3}$

d)  $\int_0^{2\pi} (\sin x + \cos x) \cdot dx$  integralinde  $x = \pi - t$

Cevap:  $\int_{-\pi}^{\pi} (\cos t - \sin t) dt$

e)  $\int_0^{\ln 3} (e^{3x} - e^x) \cdot dx$  integralinde  $e^x = u$

Cevap:  $\int_1^3 (u^2 - 1) du$

f)  $\int_1^4 e^{\sqrt{x}} \cdot dx$  integralinde  $\sqrt{x} = u$

Cevap:  $\int_1^2 2u \cdot e^u du$

g)  $\int_0^1 e^x \cdot x \cdot dx$  integralinde  $e^x = t$

Cevap:  $\int_1^e \ln t dt$

h)  $\int_0^2 \sqrt{4-x^2} \cdot dx$  integralinde  $x = 2\sin t$

Cevap:  $\int_0^{\frac{\pi}{2}} 4 \cos^2 t dt$

i)  $\int_0^{\frac{\sqrt{2}}{2}} \sin(\arccos x) \cdot dx$  integralinde  $t = \arccos x$

Cevap:  $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \sin^2 t dt$

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BELİRLİ İNTEGRALİN TÜREVİ  
LEİBNİZ FORMÜLÜ

2. Aşağıdaki türevleri hesaplayınız.

a)  $\frac{d}{dx} \int_0^4 \left( \frac{e^x + \sin x}{\ln x + \tan x} \right) dx$

Cevap: 0

b)  $\frac{d}{dx} \int_1^x (2x) dx$

Cevap: 2x

c)  $\int_1^4 d(2x+1)$

Cevap: 6

d)  $F(x) = \int_x^{x^2} (3t+1) \cdot dt$  ise

$F'(x)$  nedir?

Cevap:  $6x^3 - x - 1$

e)  $F(x) = \int_1^{2x} (5t-2) \cdot dt$  ise

$F'(x)$  nedir?

**Cevap:**  $20x-4$

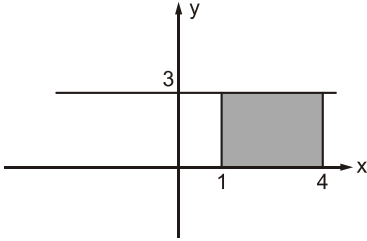
f)  $\frac{d}{dx} \left( \int_{2x+3}^{x^2-1} (3t+2) \cdot dt \right)$

**Cevap:**  $3x^2 - 2x - 16$

**ALAN HESABI**

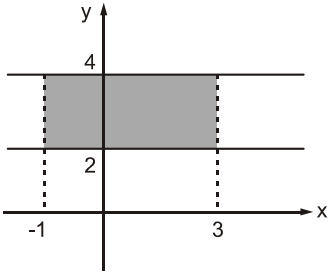
1. Şekillerde grafikleri verilen taralı bölgelerin alanlarını veren integral ifadelerini yazınız.

a)



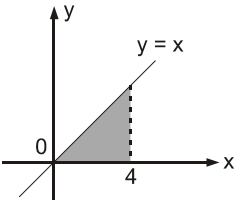
**Cevap:**  $\int_1^4 3dx$

b)



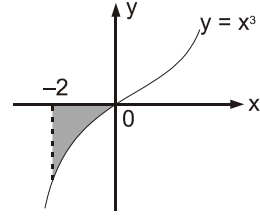
**Cevap:**  $\int_{-1}^3 2dx$

c)



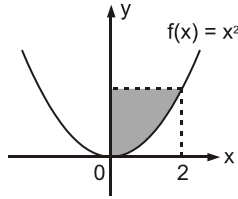
**Cevap:**  $\int_0^4 xdx$

d)



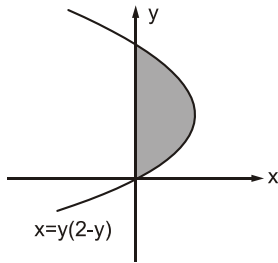
**Cevap:**  $\int_{-2}^0 x^3 dx$

e)



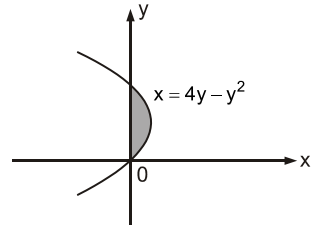
**Cevap:**  $\int_0^2 (4-x^2) dx$

f)



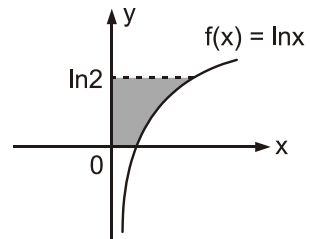
**Cevap:**  $\int_0^2 y(2-y) dy$

g)



**Cevap:**  $\int_0^4 (4y-y^2) dy$

h)



**Cevap:**  $\int_0^{\ln 2} e^y dy$

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