جلسه سوم ۱۲/۱۸

۳) $\int \sin ax\, dx = -\frac{\cos ax}{a}$

$\int \cos ax\, dx = \frac{\sin ax}{a}$

۴) $\int \sin^2 ax\, dx = \frac{x}{2} - \frac{\sin 2ax}{4a}$

$\int \cos^2 ax\, dx = \frac{x}{2} + \frac{\sin 2ax}{4a}$

$\int \cos^3 ax\, dx = \frac{\sin ax}{a} - \frac{\sin^3 ax}{3a}$

$\int \sin^5 ax\, dx = -\frac{\cos ax}{a} + \frac{2\cos^3 ax}{3a} - \frac{\cos^5 ax}{5a}$

۵) $\int e^x\, dx = e^x$

۶) $\int e^{kx}\, dx = \frac{e^{kx}}{k}$

$\int e^{2x}\, dx = \frac{e^{2x}}{2}$

$$\int e^{ax}\,dx = \frac{e^{ax}}{a}$$

(٧) $$\int \frac{1}{x}\,dx = \ln x$$

(٨) $$\int \frac{u'}{u}\,dx = \ln u$$

$$\int \frac{1}{ax+b}\,dx = \ln(ax+b)$$

$$\int \frac{x}{ax^2+b}\,dx = \frac{\ln(ax^2+b)}{2}$$

$$\frac{2x}{ax^2+b}$$ ← نشتق

(١) $$\int f(x) \pm g(x)\,dx = \int f(x)\,dx \pm \int g(x)\,dx$$

$$\int x + \cos x\,dx = \int x\,dx + \int \cos x\,dx$$

$$= \frac{x^2}{2} + \sin x$$

(٢) $\int k f(x)\,dx = k\int f(x)\,dx$

$\int \Lambda \cos ax\,dx = \Lambda \int \cos ax\,dx$

$= \Lambda \sin x$

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

$= \omega \int e^{x}\,dx - \int \frac{1}{x}\,dx = \omega e^{x} - \ln x$

(٣) $\int u\,dv = uv - \int v\,du$

$\int x \cdot e^{x}\,dx = x e^{x} - \int e^{x}\,dx = x e^{x} - e^{x}$

u dv

$\int x = u \xrightarrow{\text{تفاضل}} 1\,dx = 1\,du \Rightarrow dx = du$

$\int e^{x}\,dx = dv \xrightarrow{\text{تكامل}} e^{x} = v$

مشتق — انتگرال

+	x	e^x
−	1	e^x
+	0	e^x

$$\int x e^x dx = x e^x - e^x$$

مشتق — انتگرال

+	x	$\cos x$
−	1	$\sin x$
+	0	$-\cos x$

$$\int x \cos x dx = x \sin x + \cos x$$

مشتق — انتگرال

+	x	$\sin x$
−	1	$-\cos x$
+	0	$-\sin x$

$$\int x \sin x dx = -x \cos x + \sin x$$