

إجابات كتاب التمارين

تكامل اقترانات خاصة

أحد كلاً من التكاملات الآتية:

$$(1) \int 4e^{-5x} dx$$

$$\int 4e^{-5x} dx = -45e^{-5x} + C$$

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

$$\int (\sin 2x - \cos 2x) dx = -12\cos 2x - 12\sin 2x + C$$

$$(3) \int \cos^2 2x dx$$

$$\int \cos^2 2x dx = 12 \int (1 + \cos 4x) dx = 12x + 18\sin 4x + C$$

$$(4) \int ex + 4e^{2x} dx$$

$$\int ex + 4e^{2x} dx = \int (e-x+4e^{-2x}) dx = -e-x-2e^{-2x} + C$$

$$(5) \int (\cos x \sin^2 x - 2ex) dx$$

$$\int (\cot x \csc x - 2ex) dx = -\csc x - 2ex + C$$

$$(6) \int (3\cos 3x - \tan^2 x) dx$$

$$\int (3\cos 3x - \tan^2 x) dx = \int (3\cos 3x - (\sec^2 x - 1)) dx = \sin 3x - \tan x + x + C$$

$$(7) \int \cos x (1 + \csc^2 x) dx$$

$$\int \cos x (1 + \csc^2 x) dx = \int \cos x (1 + \frac{1}{\sin^2 x}) dx = \int \cos x + \cot x \csc x dx = \sin x - \csc x + C$$

$$(8) \int x^2 + x - 4x + 2 dx$$

$$\int x^2 + x - 4x + 2 dx = \int (x-1-2x+2) dx = 12x^2 - x - 2\ln|x+2| + C$$

$$(9) \int 1/ex dx$$

$$\int 1ex \, dx = \int e^{-12x} \, dx = -2e^{-12x} + C$$

$$(10) \int (1\cos^2 x + 1x^2) \, dx$$

$$\int (1\cos^2 x + 1x^2) \, dx = \int (\sec^2 x + x - 2) \, dx = \tan x - 1x + C$$

$$(11) \int x^2 - 2xx^3 - 3x^2 \, dx$$

$$\int x^2 - 2xx^3 - 3x^2 \, dx = 13 \int 3x^2 - 6xx^3 - 3x^2 \, dx = 13 \ln |x^3 - 3x^2| + C$$

$$(12) \int \ln e \cos x \, dx$$

$$\int \ln e \cos x \, dx = \int \cos x \, dx = \sin x + C$$

$$(13) \int \sin^2 x^2 \, dx$$

$$\int \sin^2 x^2 \, dx = 12 \int (1 - \cos x) \, dx = 12(x - \sin x) + C$$

$$(14) \int 32x - 1 \, dx$$

$$\int 32x - 1 \, dx = 32 \int 22x - 1 \, dx = 32 \ln |2x - 1| + C$$

$$(15) \int 3 - 2\cos 12x \sin^2 12x \, dx$$

$$\int 3 - 2\cos 12x \sin^2 12x \, dx = \int (3\csc^2 12x - 2\cot 12x \csc 12x) \, dx = -6\cot 12x + 4\csc 12x + C$$