

## تمارين (6)

(1) إحسب قيم التكاملات المحددة التالية:

- (i)  $\int_{-1}^1 x(x^2 + 1) dx$       (ii)  $\int_1^2 x^2 \sqrt{x^3 + 1} dx$
- (iii)  $\int_0^{\pi/4} \frac{\sin \theta}{\sqrt{\cos \theta}} d\theta$       (iv)  $\int_0^{\sqrt{2}} x \sin \frac{x^2}{2} dx$
- (v)  $\int_0^{\pi/2} (1 + \sin \theta)^{3/2} \cos \theta d\theta$       (vi)  $\int_{\frac{2}{\pi}}^{\frac{3}{\pi}} \frac{1}{t^2} \sin \frac{1}{t} dt$
- (vii)  $\int_0^{\sqrt{\pi}} x \sin \frac{x^2}{2} dx$       (viii)  $\int_2^{10} \frac{3}{\sqrt{5x-1}} dx$
- (ix)  $\int_0^4 \frac{x}{\sqrt{x^2-9}} dx$       (x)  $\int_0^5 \sqrt{x+4} dx$
- (xi)  $\int_0^1 \frac{1}{\sqrt{3-2x}} dx$       (xii)  $\int_0^1 \frac{\sqrt{x}}{1+x} dx$  ; (put  $u^2 = x$ )

(2) أوجد التكاملات التالية مستخدما التعويض المعطى :

- (i)  $\int_0^1 \frac{x dx}{(x^2 + 1)^{3/2}}$  ; (put  $u = x^2 + 1$ )
- (ii)  $\int \frac{\cos x dx}{2 \cos^2 x - 3}$  ; (put  $u = \sin x$ )
- (iii)  $\int \frac{x^3 dx}{3 \sqrt{x^2 - 4}}$  ; (put  $u = x^2$ )

(3) إحسب التكاملات التالية :

- (1)  $\int \frac{1}{(3x-1)^2} dx$       (2)  $\int \sin(2-3x) dx$
- (3)  $\int \frac{dt}{\sqrt{t-1}}$       (4)  $\int t e^{t^2+1} dt$

$$(5) \quad \int \frac{y}{\sqrt{y^2 + 1}} dy$$

$$(6) \quad \int \csc^5 x \cot x dx$$

$$(7) \quad \int \sec^3 x \tan x dx$$

$$(8) \quad \int \frac{\cos x}{\sin^2 x + 1} dx$$

$$(9) \quad \int \frac{e^x}{e^x + e^{-x}} dx$$

$$(10) \quad \int x^5 \sqrt[7]{2 + 4x^6} dx$$

$$(11) \quad \int \frac{x^3}{\sqrt{1 - x^2}} dx$$

$$(12) \quad \int \frac{\sqrt{1 + x^2}}{x} dx$$

$$(13) \quad \int \frac{e^t}{\sqrt{1 - e^{2t}}} dt$$

$$(14) \quad \int \frac{x dx}{x^2 + 8}$$

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