أتدرب وأحل المسائل

التكامل غير المحدود

أجد اقتراناً أصلياً لكلّ من الاقترانات الآتية:

(1) $f(x) = x^7$

f(x)=x7G(x)=18x8+C

(2) $f(x) = -2x^6$

f(x)=−2x6G(x)=−27x7+C

(3) $f(x) = -10$

f(x)=−10G(x)=−10x+C

(4) $f(x) = 8x$

f(x)=8xG(x)=4x2+C

أجد كلاً من التكاملات الآتية:

(5) $\int 6x\ dx$

∫6x dx=3x2+C

(6) $\int (7x - 5)\ dx$

∫(7x−5) dx=72x2−5x+C

(7) $\int (3 - 4x)\ dx$

∫(3−4x) dx=3x−2x2+C

(8) $\int 10x\ dx$

∫10x dx=∫10x−12 dx=20x12+C=20x+C

(9) $\int 2x3/2\ dx$

$\int 2x^{32} dx = \frac{4}{5}x^{52} + C$

(10) $\int (2x^4 - 5x + 10)\, dx$

$\int (2x^4 - 5x + 10)\, dx = \frac{2}{5}x^5 - \frac{5}{2}x^2 + 10x + C$

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

$\int (2x^3 - 2x)\, dx = \frac{1}{2}x^4 - x^2 + C$

(12) $\int (3x^3 - x^3)\, dx$

$\int (3x^3 - x^3)\, dx = \int (3x^{-1} - x^{32})\, dx = \frac{9}{2}x^{23} - \frac{2}{5}x^{52} + C = \frac{9}{2}x^{23} - \frac{2}{5}x^5 + C$

(13) $\int (1x^2 - 1x^3)\, dx$

$\int (1x^2 - 1x^3)\, dx = \int (x^{-2} - x^{-3})\, dx = -x^{-1} + \frac{1}{2}x^{-2} + C = -\frac{1}{x} + \frac{1}{2x^2} + C$

أجد كلاً من التكاملات الآتية:

(14) $\int 4x^3 - 2x^3\, dx$

$\int 4x^3 - 2x^3\, dx = \int (4x^3 x^3 - 2x^3)\, dx = \int (4 - 2x^{-3})\, dx = 4x + x^{-2} + C = 4x + \frac{1}{2x^2} + C$

(15) $\int 2x + 8x\, dx$

$\int 2x + 8x\, dx = \int (2x x + 8x)\, dx = \int (2x^{12} + 8x^{-12})\, dx = \frac{4}{3}x^{32} + 16x^{12} + C = \frac{4}{3}x^3 + 16x + C$

(16) $\int (x-1)^2\, dx$

$\int (x-1)^2\, dx = \int (x^2 - 2x + 1)\, dx = \frac{1}{3}x^3 - x^2 + x + C$

(17) $\int x^3 + 8x + 2\, dx$

$\int x^3 + 8x + 2\, dx = \int (x+2)(x^2 - 2x + 4)x + 2\, dx = \int (x^2 - 2x + 4) dx = \frac{1}{3}x^3 - x^2 + 4x + C$

(18) $\int x(x-1)\, dx$

$\int x(x-1)\, dx = \int (x^{32} - x^{12})\, dx = \frac{2}{5}x^{52} - \frac{2}{3}x^{32} + C = \frac{2}{5}x^5 - \frac{2}{3}x^3 + C$

(19) $\int (2x-3)(3x-1)\, dx$

$\int (2x-3)(3x-1)\, dx = \int (6x^2 - 2x - 9x + 3)\, dx = \int (6x^2 - 11x + 3)\, dx = 2x^3 - \frac{11}{2}x^2 + 3x + C$