

## إجابات كتاب التمارين

### التكامل غير المحدود

أجد كلاً من التكاملات الآتية:

$$\int (4x+2)dx \quad (1)$$

$$\int (4x+2)dx = 2x^2 + 2x + C$$

$$\int (2x-4)dx \quad (2)$$

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

$$\int (6x^2-4x)dx \quad (3)$$

$$\int (6x^2-4x)dx = 2x^3 - 2x^2 + C$$

$$\int (x-2x^5)dx \quad (4)$$

$$\int (x-2x^5)dx = \frac{1}{2}x^2 - \frac{2}{6}x^6 + C = \frac{1}{2}x^2 - \frac{1}{3}x^6 + C$$

$$\int (x-2+\frac{x^5}{2})dx \quad (5)$$

$$\int (x-2+\frac{x^5}{2})dx = \frac{1}{2}x^2 - 2x + \frac{1}{2} \cdot \frac{x^6}{6} + C = \frac{1}{2}x^2 - 2x + \frac{1}{12}x^6 + C$$

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

$$\int (3x^2-2x^2)dx = x^3 + 2x + C$$

$$\int (3x-2+6x-\frac{1}{2}+x-4)dx \quad (7)$$

$$\int (3x-2+6x-\frac{1}{2}+x-4)dx = \frac{3}{2}x^2 - 2x + 3x^2 - \frac{1}{2}x - 4x + C = \frac{9}{2}x^2 - 5x - \frac{1}{2}x + C = \frac{9}{2}x^2 - \frac{6}{2}x - \frac{1}{2}x + C = \frac{9}{2}x^2 - \frac{7}{2}x + C$$

$$\int (10x^4+8x-3)dx \quad (8)$$

$$\int (10x^4+8x-3)dx = 2x^5 + 4x^2 - 3x + C$$

$$\int (2x^3-3x)dx \quad (9)$$

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

$$\int (2x^3 - 3x) dx = \int (2x^3 - 3x - 12) dx = -x - 2 - 2x^3 + C = -1x^2 - 2x^3 + C) \int$$

$$\int (8x^3 + 6x - 4x) dx \quad (10) \int$$

$$\int (8x^3 + 6x - 4x - 12) dx = 2x^4 + 3x^2 - 8x + C = 2x^4 + 3x^2 - 8x + C$$

$$\int (7x^2 + x^4) dx \quad (11) \int$$

$$\int (7x^2 + x^4) dx = \int (7x^2 - 2 + x^4) dx = -7x^{-1} + 37x^7 + C = -7x + 37x^7 + C) \int$$

$$\int (x^2 + 3x^2) dx \quad (12) \int$$

$$\int (x^2 + 3x^2) dx = \int (13x^2 + 3x - 2) dx = 19x^3 - 3x - 1 + C = 19x^3 - 3x + C) \int$$

أجد كلاً من التكاملات الآتية:

$$\int (4 + 2x^2) dx \quad (13) \int$$

$$\int (4 + 2x^2) dx = \int (4x^2 + 2x^2) dx = \int (4x^2 - 2 + 2x - 3) dx = -4x^{-1} - 4x^{-12} + C = -4x - 4x + C$$

$$\int (x^2 + x) dx \quad (14) \int$$

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

$$\int (x^2 - 1x^2) dx \quad (15) \int$$

$$\int (x^2 - 1x^2) dx = \int (x^2 x^2 - 1x^2) dx = \int (1 - x - 2) dx = x + x - 1 + C = x + 1x + C) \int$$

$$\int (xx) dx \quad (16) \int$$

$$\int (xx) dx = \int x^3 dx = 25x^5 + C = 25x^5 + C) \int$$

$$\int (x^2 - 1x - 1) dx \quad (17) \int$$

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

$$\int (x^2(1 - x^3)) dx \quad (18) \int$$

$$\int x^2(1-x^3)dx = \int (x^2 - x^5)dx = \frac{1}{3}x^3 - \frac{1}{6}x^6 + C$$

$$\int (x+4)^2 dx \quad (19)$$

$$\int (x+4)^2 dx = \int (x^2 + 8x + 16) dx = \frac{1}{3}x^3 + 4x^2 + 16x + C$$

$$\int x x^5 dx \quad (20)$$

$$\int x x^5 dx = \int (5x^5 - x x^5) dx = \int (5x^5 - x^6) dx = \frac{5}{6}x^6 - \frac{1}{7}x^7 + C = \frac{5}{6}x^6 - \frac{1}{7}x^7 + C$$

$$\int (x^2 + 2x + 1) dx \quad (21)$$

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

$$\int x(x+1)^2 dx \quad (22)$$

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

$$\int (x+3)^2 x dx \quad (23)$$

$$\int (x+3)^2 x dx = \int (x^2 + 6x + 9) x dx = \int (x^3 + 6x^2 + 9x) dx = \frac{1}{4}x^4 + 6x^2 + \frac{9}{2}x^2 + C = \frac{1}{4}x^4 + 4x^2 + 18x + C$$

$$\int (x-5)(x+5) dx \quad (24)$$

$$\int (x-5)(x+5) dx = \int (x^2 - 25) dx = \frac{1}{3}x^3 - 25x + C$$