

問題

問題 1. 次の定積分を求めよ。

$$(1) \int_1^4 x \, dx \quad (2) \int_{-2}^2 x^2 \, dx \quad (3) \int_{-1}^3 x^3 \, dx \quad (4) \int_2^0 3 \, dx$$

問題 2. 次の定積分を求めよ。

$$(1) \int_0^3 (x^2 - 2x + 3) \, dx \quad (2) \int_{-1}^0 (-2x^2 + 5x - 1) \, dx$$

$$(3) \int_1^4 (x-1)(x-4) \, dx \quad (4) \int_{-1}^2 (x+1)(x-2) \, dx$$

$$(5) \int_{-2}^1 (-t^3 + 4t + 1) \, dt \quad (6) \int_1^3 (3t^3 - 2t^2 + 1) \, dt$$

$$(7) \int_{-1}^1 t^2(t-1) \, dt \quad (8) \int_{-2}^2 t(t+1)^2 \, dt$$

問題 3. 次の定積分を求めよ。

$$(1) \int_0^2 (x^2 + 7x + 1) \, dx + \int_0^2 (x^2 + 3x - 1) \, dx$$

$$(2) \int_1^2 (x+1)(x+2) \, dx + \int_1^2 x(x-3) \, dx$$

$$(3) \int_1^4 (x+1)^2 \, dx - \int_1^4 (x-1)^2 \, dx$$

$$(4) \int_{-1}^1 (3x^2 + x - 1) \, dx - \int_{-1}^1 (3x^2 - 2x - 1) \, dx$$

練習

練習 1. 次の定積分を求めよ。

$$(1) \int_2^3 x \, dx \quad (2) \int_{-2}^1 x^2 \, dx \quad (3) \int_{-1}^1 x^3 \, dx \quad (4) \int_1^0 4 \, dx$$

練習 2. 次の定積分を求めよ。

$$(1) \int_0^2 (x^2 + 5x - 1) \, dx \quad (2) \int_{-3}^0 (-3x^2 - x + 1) \, dx$$

$$(3) \int_2^4 (x - 2)(x - 4) \, dx \quad (4) \int_{-1}^1 (x + 1)(x - 1) \, dx$$

$$(5) \int_1^2 (-t^3 + 2t - 1) \, dt \quad (6) \int_{-1}^3 (2t^3 + 2t^2 + t) \, dt$$

$$(7) \int_{-2}^2 t^2(t + 3) \, dt \quad (8) \int_{-1}^1 t(t - 1)^2 \, dt$$

練習 3. 次の定積分を求めよ。

$$(1) \int_{-1}^0 (x^2 - 5x + 3) \, dx + \int_{-1}^0 (2x^2 + 5x + 1) \, dx$$

$$(2) \int_{-1}^2 (x + 1)(x - 3) \, dx + \int_{-1}^2 (x + 1)^2 \, dx$$

$$(3) \int_2^3 (x + 2)^2 \, dx - \int_2^3 (x - 2)^2 \, dx$$

$$(4) \int_{-2}^2 (-x^2 + 5x + 1) \, dx - \int_{-2}^2 (x^2 + 5x + 1) \, dx$$

解答

問題 1.

(1) $\frac{15}{2}$ (2) $\frac{16}{3}$ (3) 20 (4) -6

問題 2.

(1) 9 (2) $-\frac{25}{6}$ (3) $-\frac{9}{2}$ (4) $-\frac{9}{2}$ (5) $\frac{3}{4}$ (6) $\frac{134}{3}$ (7) $-\frac{2}{3}$ (8) $\frac{32}{3}$

問題 3.

(1) $\frac{76}{3}$ (2) $\frac{20}{3}$ (3) 30 (4) 0

練習 1.

(1) $\frac{5}{2}$ (2) 3 (3) 0 (4) -4

練習 2.

(1) $\frac{32}{3}$ (2) $-\frac{39}{2}$ (3) $-\frac{4}{3}$ (4) $-\frac{4}{3}$ (5) $-\frac{7}{4}$ (6) $\frac{188}{3}$ (7) 16 (8) $-\frac{4}{3}$

練習 3.

(1) 5 (2) 0 (3) 20 (4) $-\frac{32}{3}$