

2 1 階微分方程式の解法 (2)

問題 2.1. (1) $y(x) = \frac{6x}{5-3x^2}$. (2) $y(x) = \frac{(x^3+5)^2}{36x^2}$. (3) $y(x) = \frac{6e^{3x}}{\sqrt{7-2e^{6x}(6x-1)}}$. (4) $y(x) = \frac{1}{8}x\sqrt{17x^6-64}$.

問題 2.2.

$$(1) y(x) = \frac{3x + e^x + 3}{3x + e^x} \quad [y_1(x) = 1]. \quad (2) y(x) = \frac{6x - 3 - e^{2x}(2x + 1)}{e^{2x} - 3} \quad [y_1(x) = -2x + 1].$$

$$(3) y(x) = \frac{2x^3 + 4}{4x - x^4} \quad \left[y_1(x) = \frac{1}{x} \right]. \quad (4) y(x) = \frac{36 \log x + 5}{x^3(1 - 9 \log x)} \quad \left[y_1(x) = -\frac{4}{x^3} \right].$$

問題 2.3.

$$(1) x^2 + 3xy - 2y^2 + x + y = 0. \quad (2) x^3 + 3x^2y - y^3 + 2x - 4y = 0.$$

$$(3) x^2y^2 + 3y^2 + 6x - 4\cos x = 0. \quad (4) x^5 + 5x^3y^2 - 5xy^4 + 418 = 0.$$

$$(5) x + 2x \cos y + ye^x - 2y = 0.$$

問題 2.4.

$$(1) e^{2x}(x^2 - 3xy^2 + 5y) = 9 \quad [M(x) = e^{2x}]. \quad (2) x^3y - 3x^2y^4 = -4 \quad [M(x) = x].$$

$$(3) y^4(x^3 - 4x^2y + 3xy^2) = -2 \quad [M(y) = y^3]. \quad (4) e^{y^2}(x^4 - 2xy^3) = 3e \quad [M(y) = e^{y^2}].$$