

答案 3.1

1. 求解下列方程

$$(1) y = -c_1 e^{\frac{1}{2}x^2} + x + c_2$$

$$(2) x(t) = \sinh(t + c_1) + c_2 t + c_3$$

$$(3) x(t) = \pm \sqrt{-t^2 + 2c_1 t - c_1^2 + a^2} + c_2$$

$$(4) x(t) = \frac{1}{8}c_1 \cos 2t + \frac{1}{4}c_1 t^2 + c_2 t + \frac{t^2}{2} + c_3$$

$$(5) x(t) = c \text{ 或 } x(t) = \pm \frac{\sqrt{-2c_1 t - 2c_2}}{c_1} + c_3$$

$$(6) x(t) = -\frac{4}{t+2} - 1$$

2. 求下列方程的解

$$(1) x(t) = c \text{ 或 } x(t) = \frac{c_1 e^{c_1 t}}{-e^{c_1 t} + c_1 c_2}$$

$$(2) x(t) = \pm \sqrt{-t^2 + c_1 t + c_2}$$

$$(3) \ln|x(t)| = c_1 e^t + c_2 e^{-t}$$

$$(4) x(t) = c_1 \cos \omega t + c_2 \sin \omega t$$

$$(5) x(t) = c_1 e^{\omega t} + c_2 e^{-\omega t}$$

$$(6) \frac{c_1}{2}x^2 - \frac{1}{c_1} \ln x + c_2 = 2t$$

$$(7) x(t) = \ln(t^2 - 2c_2 t + c_2^2 - \frac{1}{4}c_1)$$

$$(8) x(t) = \pm \frac{2c_1 e^{c_2 - c_1 t}}{e^{2(c_2 - c_1 t)} - 1}$$

$$(9) x(t) = c \text{ 或 } x(t) = 1 - \frac{1}{c_1 t + c_2}$$

3. 求下列方程的解

$$(1) \quad x(t) = 0 \quad \text{或} \quad x(t) = c_2 e^{t^3 - c_1 t}$$

$$(2) \quad x(t) = 0 \quad \text{或} \quad x(t) = c_2 t^{\frac{8}{5}} e^{\frac{1}{5} c_1 t^5}$$

$$(3) \quad x^2 - 2tx - t^2 = 2 \sin t + c_1 t + c_2$$

$$(4) \quad x = \sqrt{2c_1} \tan \left(\frac{\sqrt{2c_1} t^2}{4} + c_2 \right)$$

$$(5) \quad x(t) = 0 \quad \text{或} \quad x(t) = c_2 e^{c_1 t + 4t^{\frac{5}{2}}}$$

$$(6) \quad x(t) = 0 \quad \text{或} \quad x(t) = \pm \sqrt{c_1 t^2 + c_2 t}$$

$$(7) \quad x^2 = c_1 + c_2 t^{-2} + \frac{1}{6} t^4$$