

1. (seperable) $y = \frac{-1}{\frac{1}{3} \ln |3x + 1| - 1}$

2. (linear) $y = x^5 + 3x^2$

3. (homogeneous and Bernoulli type) $y = x \sqrt{\frac{Ax^4 - 1}{2}}$

4. (a) Show that $M_y = N_x = 24xy^2 + 3$
(b) $4x^2y^3 + 5x^2 + 3xy - 2y^3 = C$

5. (Bernoulli type) $y = \sqrt{\frac{2}{3}e^x + \frac{10}{3}e^{-2x}}$

6. $t = 2 \frac{\ln(19/31)}{\ln(27/31)} \approx 7.08$ hours

7. $x(t) = 2(20 + t) - \frac{12,000}{(20 + t)^2}$