

6.
$$y(x) + A \int_{a}^{x} y^{2}(t) dt = Bx + C$$
.

 1° . Solution for AB > 0:

$$y(x) = k \frac{(k+y_a) \exp[2Ak(x-a)] + y_a - k}{(k+y_a) \exp[2Ak(x-a)] - y_a + k}, \qquad k = \sqrt{\frac{B}{A}}, \quad y_a = aB + C.$$

 2° . Solution for AB < 0:

$$y(x) = k \tan \left[Ak(a-x) + \arctan \frac{y_a}{k} \right], \qquad k = \sqrt{-\frac{B}{A}}, \quad y_a = aB + C.$$

 3° . Solution for B = 0:

$$y(x) = \frac{C}{AC(x-a)+1}.$$

Reference

Polyanin, A. D. and Manzhirov, A. V., Handbook of Integral Equations, CRC Press, Boca Raton, 1998.

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