

Sec. 1.1: problems 24, 36, 40.

Remark: In problem 24, only check that $y(x)$ satisfies the differential equation and find the value of the constant C for which $y(x)$ satisfies the given initial condition.

Sec. 1.2: problems 3, 10.

Sec. 1.4: problems 1, 5, 15, 27.

Sec. 1.5: problems 16, 19, 23, 30.

Additional Problem 1. Prove that the function $y(x)$ determined explicitly from the equation

$$\frac{1}{3y^3} - \frac{2}{y} = \frac{1}{x} + \ln|x| + C$$

(where C is an arbitrary constant) satisfies the ordinary differential equation

$$\frac{dy}{dx} = \frac{(x-1)y^5}{x^2(2y^3 - y)}.$$