

**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

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