

- §1.3#22 Sketch the slope field and some representative solution curves for the given differential equation

$$y' = x^2y$$

- §1.4 #14 Solve the given initial value problem

$$\frac{dy}{dx} = 1 - \frac{\sin(x+y)}{\sin y \cos x}, \quad y(\pi/4) = \pi/4.$$

- §1.6 #16 Solve the initial value problem.

$$(\sin x)y' - y \cos x = \sin 2x, \quad y(\pi/2) = 2.$$

- §1.7 #6 A tank initially contains 20 L of water. A solution containing 1 g/L of chemical flows into the tank at a rate of 3 L/min, and the mixture flows out at a rate of 2 L/min.
  1. Set up and solve the initial value problem for  $A(t)$ , the amount of chemical in the tank at time  $t$ .
  2. When does the concentration of chemical in the tank reach 0.5 g/L?

- §1.7 #12 Solve the given homogeneous differential equation.

$$xy' = \sqrt{16x^2 - y^2} + y, \quad x > 0.$$

- §1.8 #38 Solve the given (Bernoulli) differential equation.

$$\frac{dy}{dx} + \frac{1}{2}(\tan x)y = 2y^3 \sin x.$$

- §1.9 #8 Solve the given exact differential equation.

$$(y^2 - 2x) dx + 2xy dy = 0$$