Example 1. \( \frac{dy}{dx} = x - y \) (Use slope fields).

Example 2. Use Euler’s method with step size \( h = 0.5 \) to solve \( \frac{dy}{dx} = x - y \) with initial value \( y(0) = 1 \).

Example 3. Use Euler’s method with step size \( h = 0.1 \) to solve \( \frac{dy}{dx} = xy \) with initial value \( y(1) = 1 \). Find \( y(1.5) \).

Example 1. Solve \( \frac{dy}{dx} = ky \).

Example 2. Solve \( \frac{dy}{dx} = xy \) with initial condition \( y(1) = 1 \) and compare the approximating result \( y(1.5) \) with Example 3 in §9.2.

Example 3. Solve \( \frac{dy}{dx} = \frac{2x}{6y^2 - \sin y} \).

Example 4. Solve \( \frac{dy}{dx} = 4x^3y \) with the initial condition \( y(0) = 3 \).

Example 5. Solve \( (\sec^2 y)x^{-1}y' = e^{2x^2} \).

Example 6. Find the orthogonal trajectories of the family of curves \( y = kx \) for \( k \in \mathbb{R} \).

Example 7. Find the orthogonal trajectories of the family of curves \( y = kx^2 \) for \( k \in \mathbb{R} \).