

Slope Field Practice

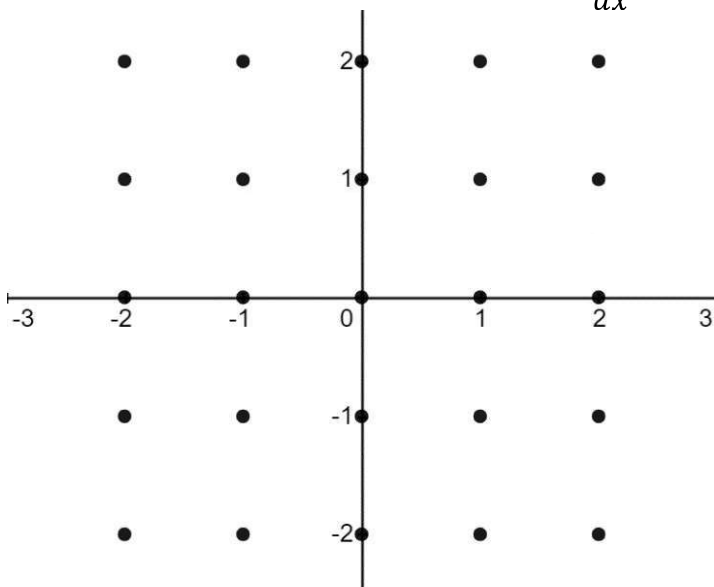
Check your solutions using: [geogebra.org/m/W7dAdgqc](https://www.geogebra.org/m/W7dAdgqc)
(use step size of 0.01)

Draw the slope fields for the following differential equations. Solve the equation or predict the indicated value when asked.

1. Solve the differential equations

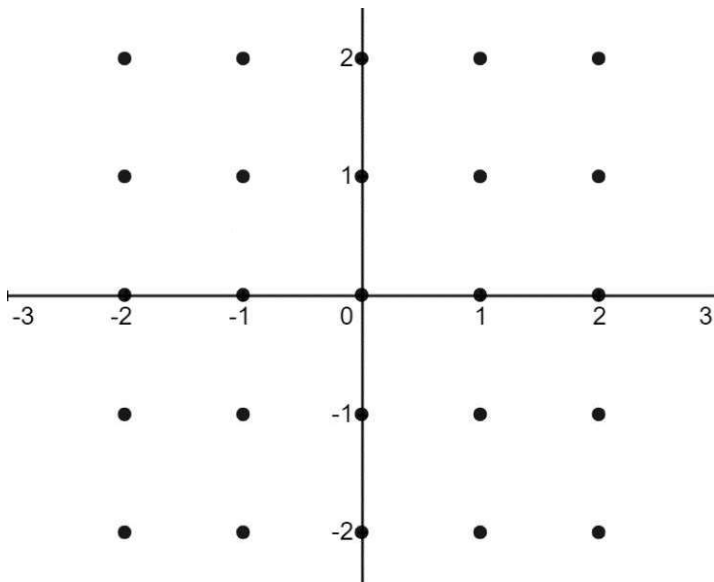
a.

$$\frac{dy}{dx} = x(x - 2), \quad y(-1) = 0$$



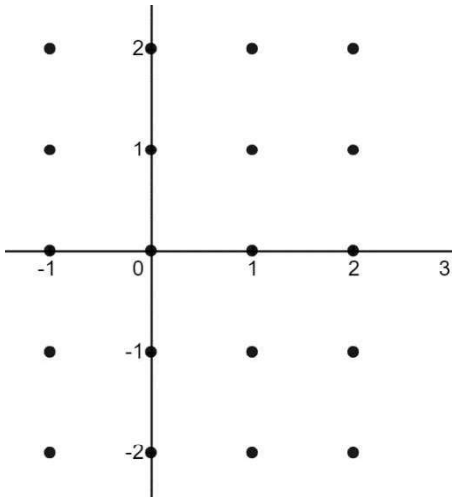
b.

$$\frac{dx}{dt} = \frac{1}{t + 1}, \quad x(0) = 1$$



c.

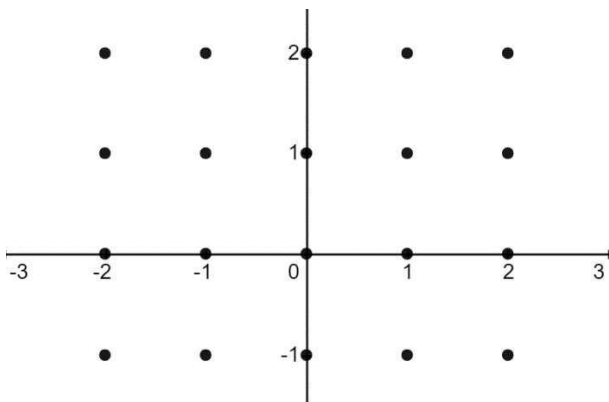
$$\frac{dm}{dr} = \frac{1}{r^2} - 1, \quad m(1) = 1$$



2. Predict the value

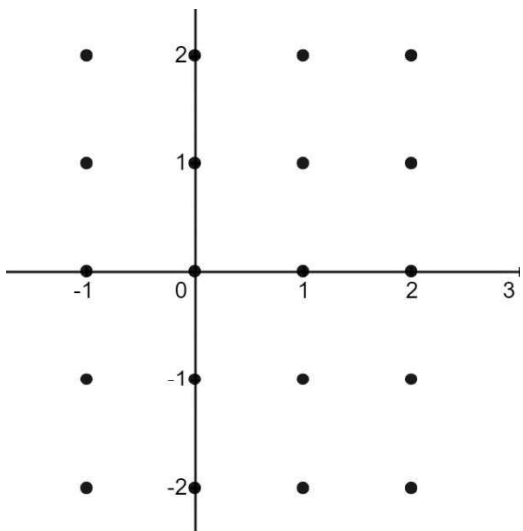
a. $y(1)$ if

$$\frac{dy}{dx} = \frac{y}{2}, \quad y(-2) = 0.5$$



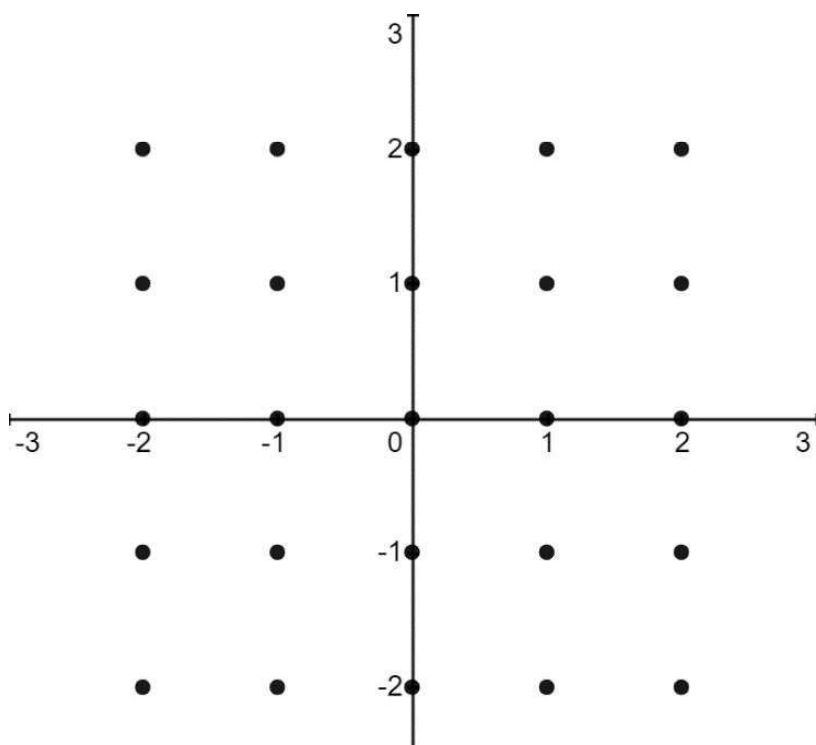
b. $y(2)$ if

$$\frac{dy}{dx} = xe^{-y}, \quad y(0) = 1 \text{ OR } -1$$



c. $x(2)$ if

$$\frac{dx}{dt} = -\frac{1}{2}(x+1)(x-2), \quad x(-1) = 0 \text{ OR } 3$$



3. Use [geogebra.org/m/W7dAdgqc](https://www.geogebra.org/m/W7dAdgqc) to draw the slope fields for the following differential equations and solution curves (use step size of 0.01)
- a. $y(0) = 2, 0, \text{ and } -1$

$$\frac{dy}{dx} = x^2 + y$$

b. $y(0) = 4, 2, \text{ and } -2$

$$\frac{dy}{dx} = \frac{x}{x - y}$$

c. Initial conditions of $y(-2) = 0; y(-1) = 0; y(2) = 1; \text{ and } y(2) = 0$

$$\frac{dy}{dx} = \ln(x^2 + y^2)$$