MAT 112 Slope Field Homework

Sketch the solution to the following differential equations with the given initial values, using the Desmos slope field generator to produce the slope field. Export the slope field by clicking Share, Export image, and paste it into a document. Print the document and sketch your solution on the graph.

For #1, 2, and 3, also solve the differential equation by hand, and in each case confirm that your solution matches your sketch.

1. \( \frac{dy}{dx} = \frac{1}{y} \quad y(0.5) = 2 \)
2. \( \frac{dy}{dx} = \frac{1}{x} \quad y(1) = 1 \)
3. \( \frac{dy}{dx} = \frac{x}{y} \quad y(1) = 1 \)
4. \( \frac{dy}{dx} = \frac{x}{y} \quad y(1) = -1 \)
5. \( \frac{dy}{dx} = x^2y \quad y(1.5) = 2.5 \)
6. \( \frac{dy}{dx} = x^2y \quad y(-0.5) = 2.5 \)
7. \( \frac{dy}{dx} = \frac{x + y}{y - x} \quad y(0) = 2 \)
8. \( \frac{dy}{dx} = \frac{x + y}{y - x} \quad y(0) = 0.2 \)
9. \( \frac{dy}{dx} = \sin(y) \quad y(1) = 1 \)