

# Slope Fields

Math 230

1. Consider the differential equation  $\frac{dy}{dt} = y^3 - 2y^2$ .
  - (a) Sketch the slope field for this differential equation.
  - (b) What are the equilibrium solutions?
  - (c) If a particular solution passes through the point  $(t, y) = (1, 1)$ , then what is the behavior of that solution as  $t \rightarrow \infty$ ?

2. Suppose we know that  $y(t) = t^3$  is a solution to a differential equation  $\frac{dy}{dt} = f(y)$  for some function  $f$ . Sketch the slope field for this differential equation.

3. Sketch the slope field for the differential equation

$$\frac{dy}{dt} = \frac{t^4}{y^4 - 1}.$$

What appears to be behavior of solutions as  $t \rightarrow \infty$ ?