Separable Equations

Goal: Solve Nonlinear Equations

What is a linear equation?

What is a nonlinear equation?

Example: Find the solutions of

\[ \frac{dy}{dx} = \frac{1}{1+2y} \]
Graph integral curves

Example: Find the solutions of

\[ \frac{dy}{dx} = -\frac{5}{y(1+x)^2} \]

and graph those solutions
Example: Find the integral curves for
\[ \frac{dy}{dx} = \frac{x^2}{1-y^2} \]
FIGURE 2.2.1  Direction field and integral curves of \( y' = \frac{x^2}{1 - y^2} \).