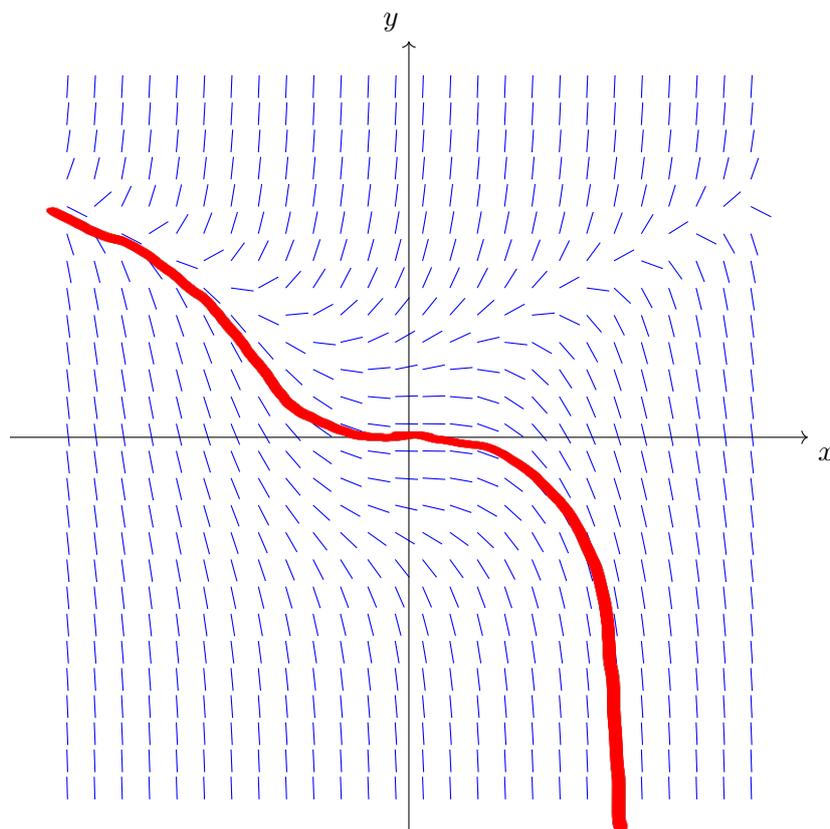


Print your name: _____

Answer each question completely. You must justify your answers to get credit. Even a correct answer with no justification will get no credits. Each problem is worth 5 points.

1. Below is the slope field of the first order ODE $y' = y^3 - x^2$. Sketch the graph of the solution passing through the origin.



2. Find the general solution of the first order ODE $(1+x)y' = \frac{1}{y}$.

$$(1+x) \frac{dy}{dx} = \frac{1}{y} \Leftrightarrow y \, dy = \frac{1}{1+x} \, dx$$

$$\Leftrightarrow \int y \, dy = \int \frac{1}{1+x} \, dx \Leftrightarrow y^2 = 2 \log|1+x| + C$$

$$\Leftrightarrow y = \pm \sqrt{2 \log|1+x| + C}$$