1. How many critical points does the following autonomous first order ODE have?

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Follow-up. Draw a phase portrait.

2. Suppose f is the function of y whose graph is depicted below. How many critical points does the autonomous ODE $y' = f(y)$ have?

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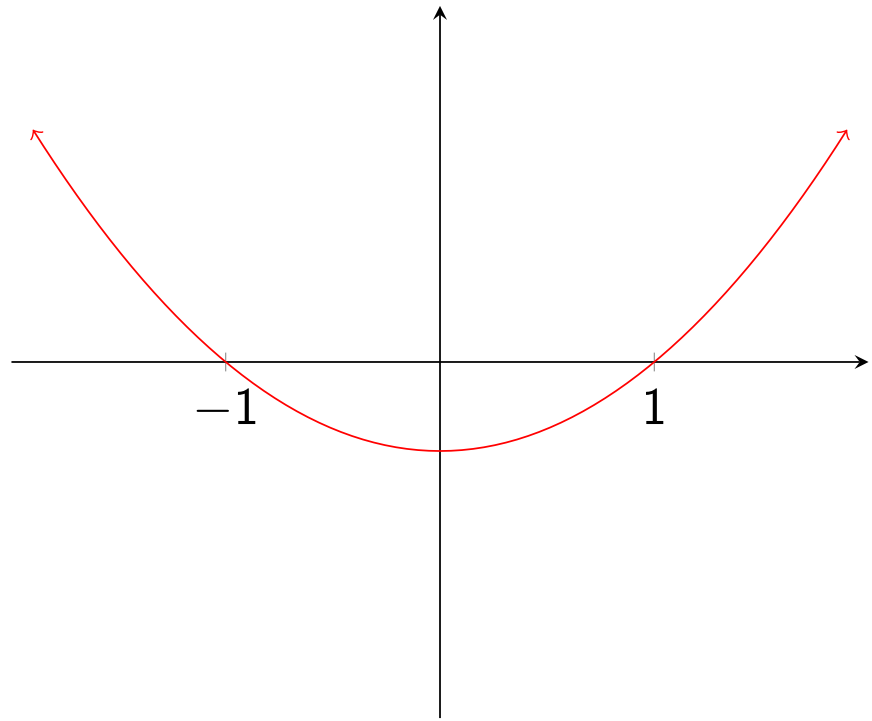

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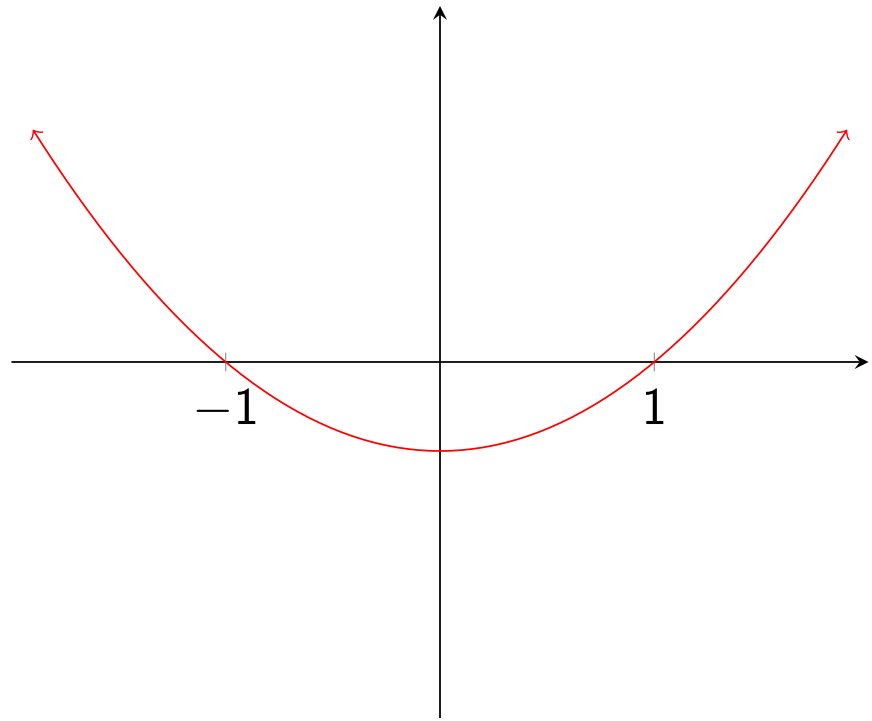

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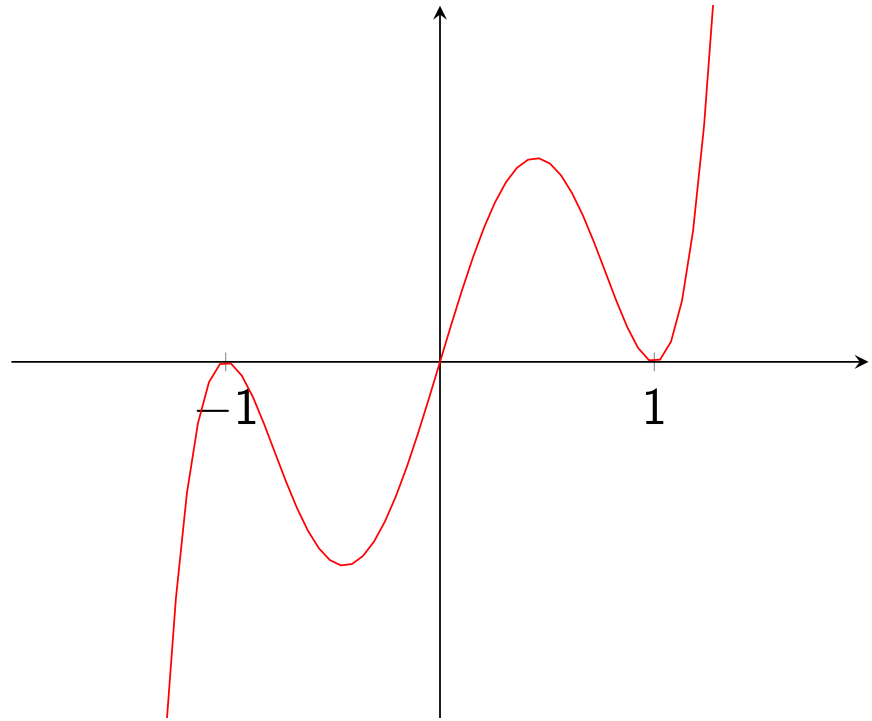

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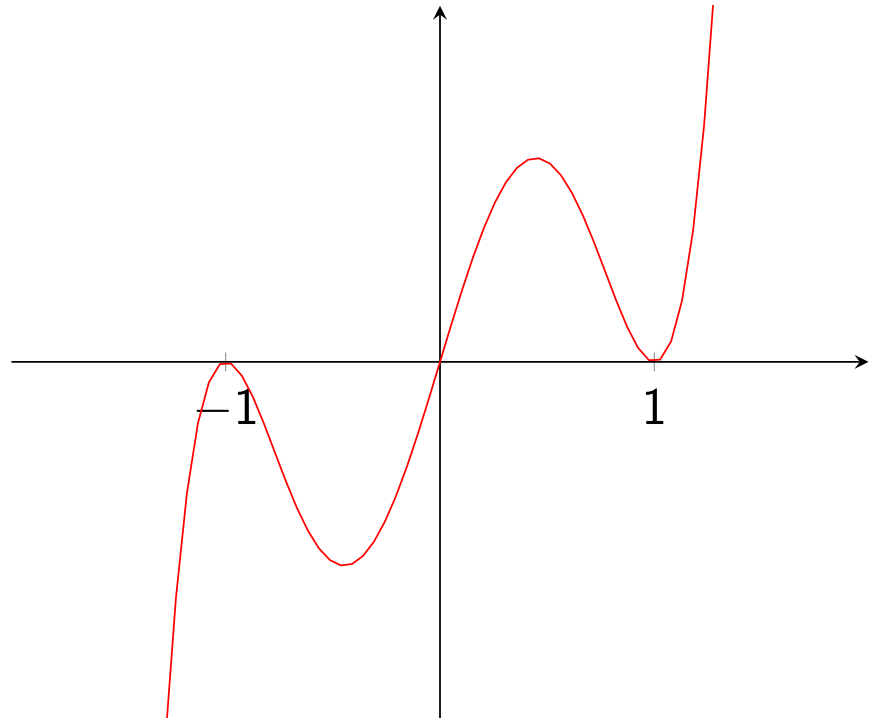

Follow-up. Draw a phase portrait.

4. True or False?

All critical points of the autonomous ODE $x' = \sin x$ are unstable.

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This ODE is...

(A) Separable but not linear.

(B) Linear but not separable.

(C) Both linear and separable.

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Follow-up. Solve it!

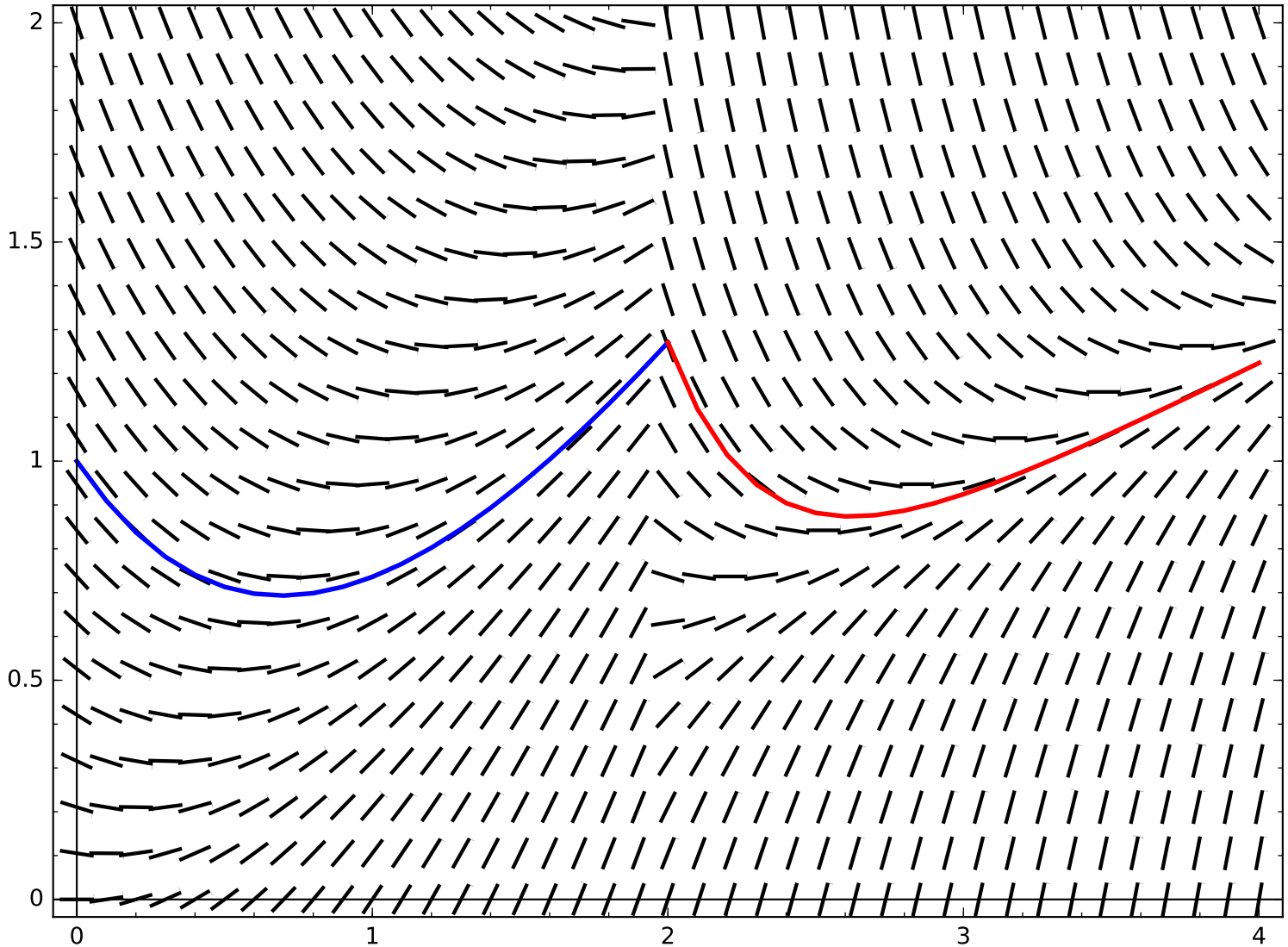
6. True or False?

Let p be the discontinuous function

$$p(x) = \begin{cases} 1 & \text{if } x < 2 \\ 3 & \text{if } x \geq 2 \end{cases}$$

There is a continuous function y, defined on all real numbers and differentiable everywhere except $x = 2$, such that

$$y' + p(x)y = x \text{ and } y(0) = 1.$$


2
1.5
1
0.5
0
0
1
2
3
4