7. [6 points] A curve $\mathcal{C}$ gives y as an implicit function of x. This curve passes through the point $(-2, 1)$ and satisfies

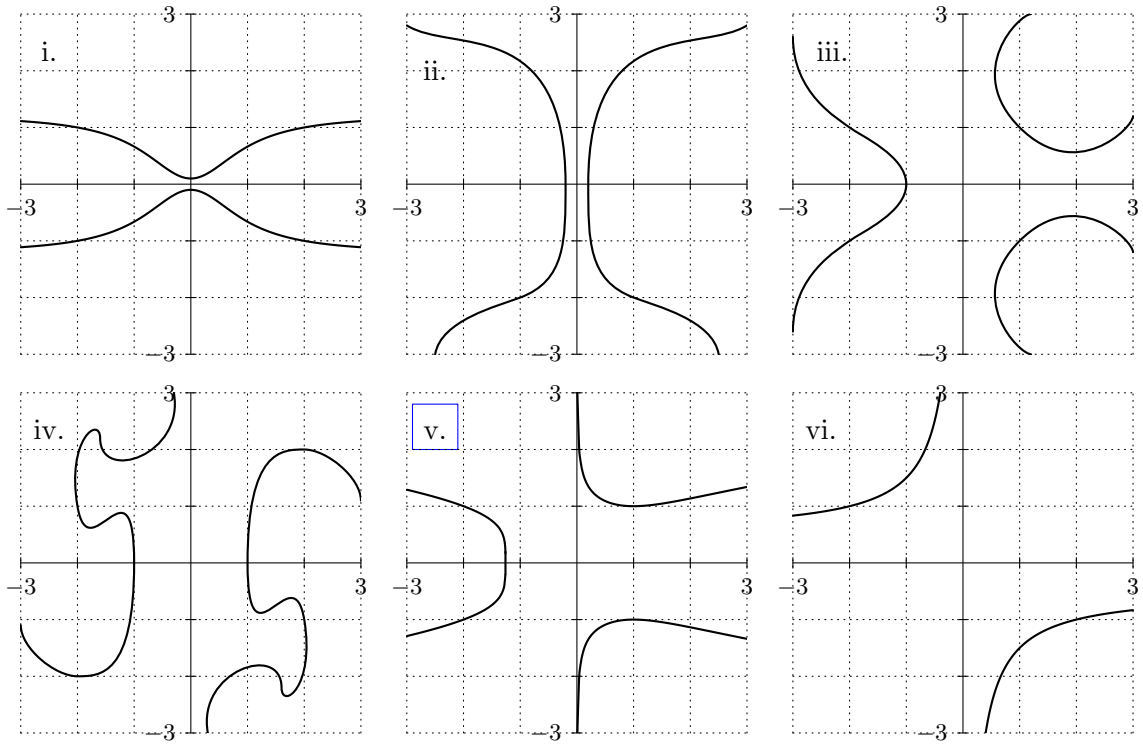
$$\frac{dy}{dx} = \frac{x^2 - y^4}{2xy^3}.$$

a. [1 point] One of the values below is the slope of the curve $\mathcal{C}$ at the point $(-2, 1)$. Circle that one value.

Answer: The slope at $(-2, 1)$ is

$$-\frac{3}{16} \qquad -\frac{1}{4} \qquad -\frac{3}{8} \qquad -\frac{1}{2} \qquad -\frac{5}{8} \qquad \boxed{-\frac{3}{4}} \qquad -\frac{15}{16}$$

b. [5 points] One of the following graphs is the graph of the curve $\mathcal{C}$. Which of the graphs i-vi is it? To receive any credit on this question, you must circle your answer next to the word "Answer" below.



Remember: To receive any credit on this question, you must circle your answer next to the word "Answer" below.

Answer: i. ii. iii. iv. [v.] vi.

Solution: The curve must pass through the point $(-2, 1)$, which rules out (ii). As seen in part (a), the slope at $(-2, 1)$ is negative, which rules out (vi). The tangent lines must be horizontal when the curve crosses the x- or y-axis, which rules out (i). Graph (iv) can be ruled out in a number of ways: the magnitude of the slope is too large at $(-2, 1)$, there should not be vertical tangent lines away from the axes, and there should not be a horizontal tangent line at $(2, 2)$. Finally, there should be a horizontal tangent through $(1, 1)$, ruling out (iii). This leaves graph (v).
Note: The slope at the point $(-2, 1)$ in graph (v) as it appears here is not sufficiently steep. For this reason, full credit was also awarded for choosing graph (iii).