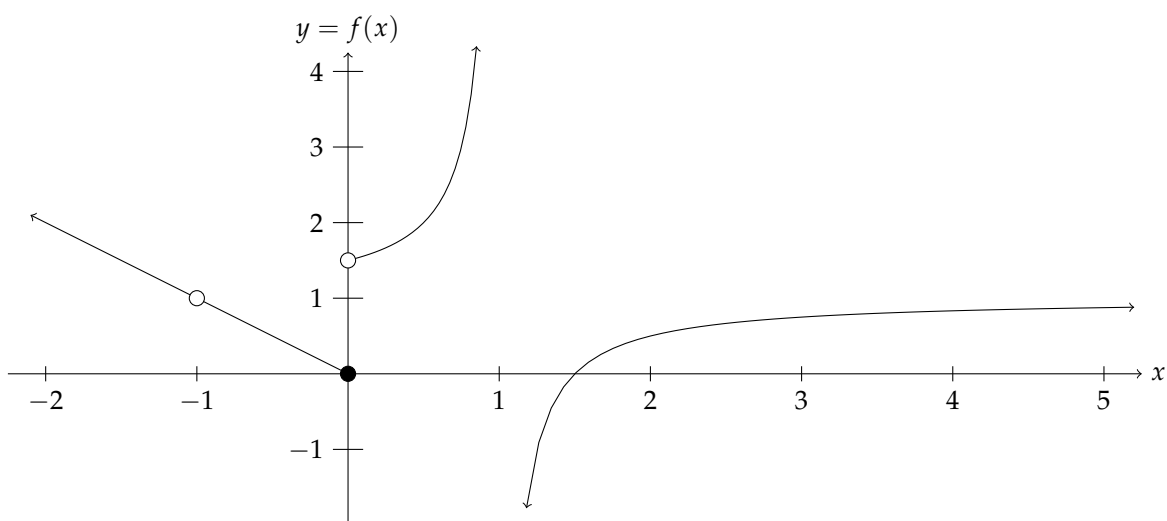


Quiz 2 — Wednesday, July 7

Name: _____

1. (4 points) Let $f(x) = \begin{cases} \frac{-x^2 - x}{x + 1}, & x \leq 0 \\ \frac{2x - 3}{2(x - 1)}, & x > 0 \end{cases}$. A graph of f over $[-2, 5]$ is given below.



Describe the types and locations of the discontinuities of f and the asymptotes of f . You do not need to justify your answers.

- f has a _____ discontinuity at $x =$ _____
- f has a _____ discontinuity at $x =$ _____
- f has a _____ discontinuity at $x =$ _____
- The graph has vertical asymptote(s) at _____.
- The graph has horizontal asymptote(s) at _____.

2. (2 points) Evaluate $\lim_{x \rightarrow 3} \frac{\frac{1}{3} - \frac{1}{x}}{x - 3}$, if it exists.

3. (2 points) Evaluate $\lim_{x \rightarrow \infty} \sqrt{9x^2 + x} - 3x$, if it exists.

4. (2 points) Use the Intermediate Value Theorem to show that the equation $2^x = 2 - x$ has a solution c in the interval $(0, 1)$.