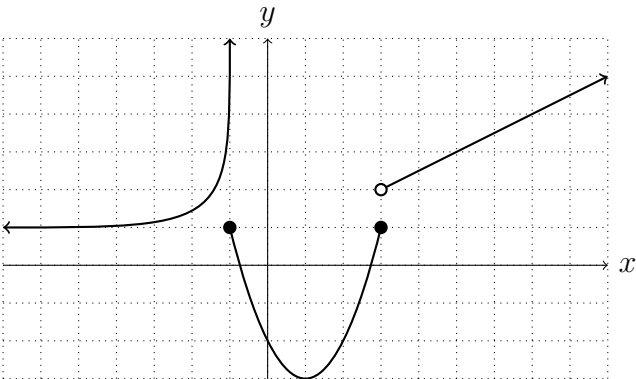


Problem 1: Answer the following questions according to the graph of $y = f(x)$ as shown. Note one hollow dot at $(3, 2)$ and one solid dot at $(3, 1)$.



a. $f(3) =$ 1

b. $\lim_{x \rightarrow 3^-} f(x) =$ 1

c. $\lim_{x \rightarrow 3^+} f(x) =$ 2

d. $\lim_{x \rightarrow 3} f(x) =$ DNE

e. $\lim_{x \rightarrow \pi} \frac{f(x) - f(\pi)}{x - \pi} =$ 1/2

f. $\lim_{x \rightarrow 1} \frac{f(x) + 3}{x - 1} =$ 0

g. $\lim_{x \rightarrow -\infty} f(x) =$ 1

h. $\lim_{x \rightarrow -1^-} f(x) =$ ∞

Score: /8

Problem 2: Evaluate the following limit. Show all steps.

$$\lim_{x \rightarrow 4} \frac{x^2 - 5x + 4}{|4 - x|}$$

$$\begin{aligned} \lim_{x \rightarrow 4^-} \frac{x^2 - 5x + 4}{|4 - x|} &= \lim_{x \rightarrow 4^-} \frac{(x - 1)(x - 4)}{4 - x} = \lim_{x \rightarrow 4^-} \frac{(x - 1)(x - 4)}{-(x - 4)} = \lim_{x \rightarrow 4^-} -(x - 1) = -3, \\ \lim_{x \rightarrow 4^+} \frac{x^2 - 5x + 4}{|4 - x|} &= \lim_{x \rightarrow 4^+} \frac{(x - 1)(x - 4)}{-(4 - x)} = \lim_{x \rightarrow 4^+} \frac{(x - 1)(x - 4)}{x - 4} = \lim_{x \rightarrow 4^+} x - 1 = 3, \end{aligned}$$

so $\lim_{x \rightarrow 4} \frac{x^2 - 5x + 4}{|4 - x|}$ does not exist.

Score: /2