

AP CALCULUS AB – SKETCHING GRAPHS USING LIMITS

Sketch ONE complete graph using the information about limits.

1)

$$f(0) = -3$$

$$f(4) = 5$$

$$\lim_{x \rightarrow 4^-} f(x) = 5$$

$$\lim_{x \rightarrow 4^+} f(x) = 3$$

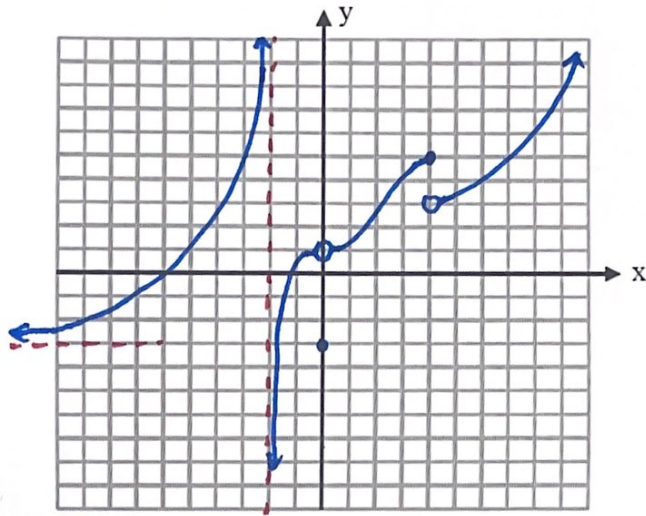
$$\lim_{x \rightarrow 0} f(x) = 1$$

$$\lim_{x \rightarrow -2^-} f(x) = \infty$$

$$\lim_{x \rightarrow -2^+} f(x) = -\infty$$

$$\lim_{x \rightarrow -\infty} f(x) = -3$$

$$\lim_{x \rightarrow \infty} f(x) = \infty$$



2)

$$f(2) = 1$$

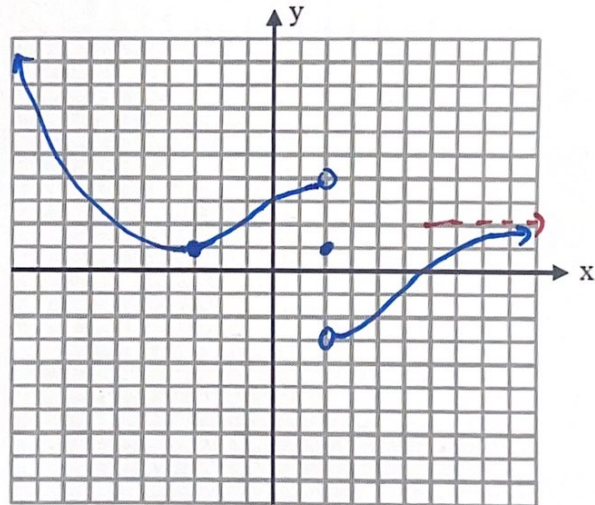
$$\lim_{x \rightarrow 2^-} f(x) = 4$$

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

$$\lim_{x \rightarrow 3} f(x) = 1$$

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

$$\lim_{x \rightarrow \infty} f(x) = 2$$



3) Show that $f(x)$ is continuous at $x = 2$ for $f(x) = \begin{cases} 5-x, & x \leq 2 \\ x^2-1, & x > 2 \end{cases}$

I. $f(2) = 3$

II. $\lim_{x \rightarrow 2^-} (5-x) \stackrel{?}{=} \lim_{x \rightarrow 2^+} (x^2-1)$
 $3 = 3$

$$\lim_{x \rightarrow 2} f(x) = 3$$

III. $f(2) = \lim_{x \rightarrow 2} f(x)$

$\therefore f(x)$ is cont. @ $x = 2$.