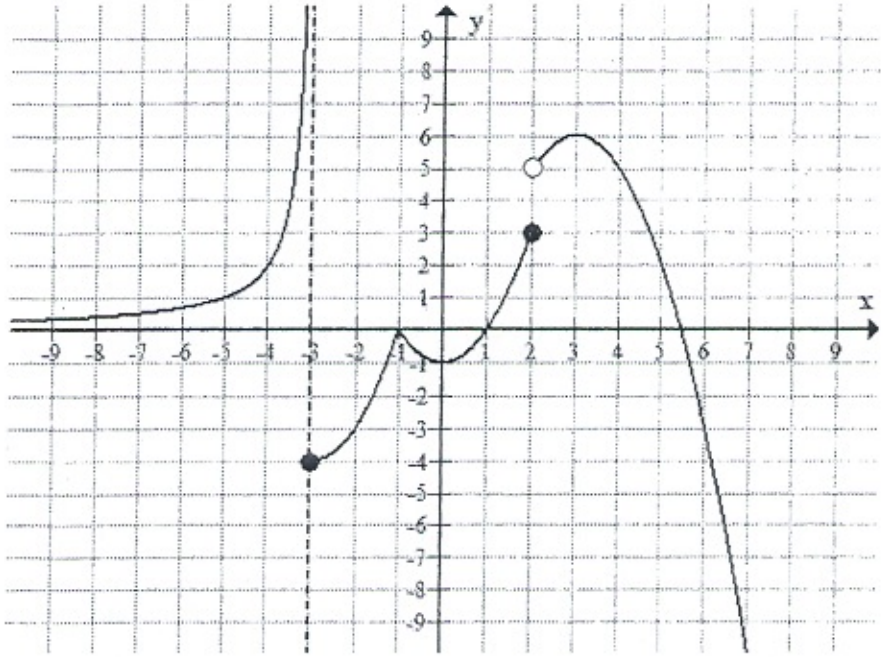
Problem 3 The graph of a function f is given below. Use the graph to find the limits below. Specify if a limit does not exist or is infinite.



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

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

$\lim_{x\to -1} f(x) =$ $\lim_{x\to -\infty} f(x) =$ $\lim_{x\to +\infty} f(x) =$

Problem 4 Sketch the graph of a function $y = f(x)$ which satisfies **all** of the following conditions:

(i) the domain of f is $(0, +\infty)$; (ii) $f(2) = f(4) = 0$;

(iii) $\lim_{x\to 0^+} f(x) = -\infty$; (iv) $\lim_{x\to 2} f(x) = +\infty$;

(v) $\lim_{x\to 4^-} f(x) = 0$ and $\lim_{x\to 4^+} f(x) = 1$;

(vi) $\lim_{x\to +\infty} f(x) = 3$.