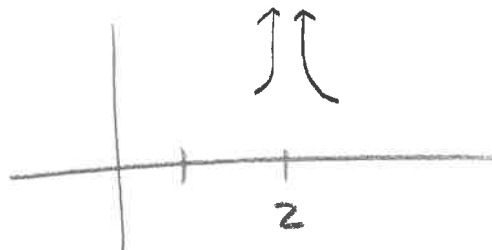# 2.2 AP Style Questions

1. The values of $f(x)$ of a function f can be made arbitrarily large by taking x sufficiently close to 2 but not equal to 2. Which of the following statements must be true?

   a. $f(2)$ does not exist

   b. f is continuous at $x = 2$

   c. $\lim\limits_{x \to 2} f(x) = \infty$

   d. $\lim\limits_{x \to \infty} f(x) = 2$

2. The function g is continuous at all x except $x = 2$. If $\lim\limits_{x \to 2} g(x) = \infty$, which of the following statements about g must be true?

   a. $g(2) = \infty$

   b. The line $x = 2$ is a horizontal asymptote to the graph of g.

   c. The line $x = 2$ is a vertical asymptote to the graph of g.

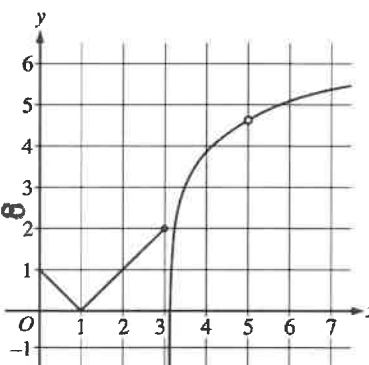   d. The line $y = 2$ is a vertical asymptote to the graph of g.
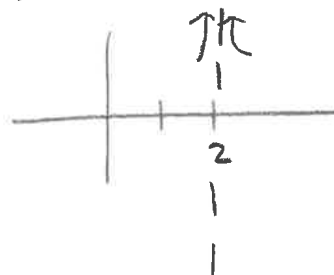
3. The graph of the function f is shown below. Which of the following limits does not exist?

   a. $\lim\limits_{x \to 1^-} f(x) = 0$

   b. $\lim\limits_{x \to 1} f(x) = 0$

   c. $\lim\limits_{x \to 3^-} f(x) = 2$

   d. $\lim\limits_{x \to 3} f(x)$ DNE $\lim\limits_{x \to 3^+} f(x) = -\infty$

   e. $\lim\limits_{x \to 5} f(x) \approx 4.75$ $\lim\limits_{x \to 3^-} f(x) = 2$

Graph of f

4. $\lim\limits_{n \to \infty} \frac{3n^3-5n}{n^3-2n^2+1}$ is
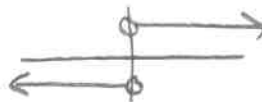
    a. -5
    b. -2
    c. 1
    (d. 3)
    e. Nonexistent

5. Which of the following limits are equal to -1?

    ✓ I. $\lim\limits_{x \to 0^-} \frac{|x|}{x}$

    II. $\lim\limits_{x \to 3} \frac{x^2-7x+12}{3-x}$

    ✓ III. $\lim\limits_{x \to \infty} \frac{1-x}{1+x} = -1$

    a. I only
    (b. I and III only)
    c. II and III only
    d. I, II, and III only

HA
↳ exponents same so $\frac{-1}{1} = -1$

$$\lim\limits_{x \to 3} \frac{x^2-7x+12}{3-x}$$

$$\lim\limits_{x \to 3} \frac{(x-4)(x-3)}{-(x-3)}$$

$$\lim\limits_{x \to 3} \frac{x-4}{-1}$$

$$\lim\limits_{x \to 3} -x+4 = 1$$