Put your solutions on this page.

Do not use your phones or calculators.

(1) $\lim\limits_{x\to 0} \dfrac{x}{\sqrt{x+1}-1} =$

(5) $\lim\limits_{x\to 1} \dfrac{1-a^2}{1-a} =$

(2) $\lim\limits_{x\to \frac{1}{2}^-} \dfrac{|2x-1|}{2x-1} =$

(6) $\lim\limits_{a\to 4} \dfrac{2-\sqrt{a}}{4-a} =$

(3) $\lim\limits_{x\to 3} \sqrt{x-3} =$

(7) $\lim\limits_{x\to 2} \dfrac{8-a^3}{2-a} =$

(4) $\lim\limits_{x\to 3^+} \sqrt{x-3} =$

(8) $\lim\limits_{x\to 1} \dfrac{1-\frac{1}{a}}{1-a} =$

(9) $\lim\limits_{x\to -1} g(x)$ = _____ in the graph shown.

(10) $\lim\limits_{x\to -1} g(x)$ _____ in the graph shown.

(11) $\lim\limits_{x\to 2} g(x)$ = _____ in the graph shown.

(12) $\lim\limits_{x\to 2^-} g(x)$ = _____ in the graph shown.

(13) $\lim\limits_{x\to 2^+} g(x)$ = _____ in the graph shown.

y=g(x)
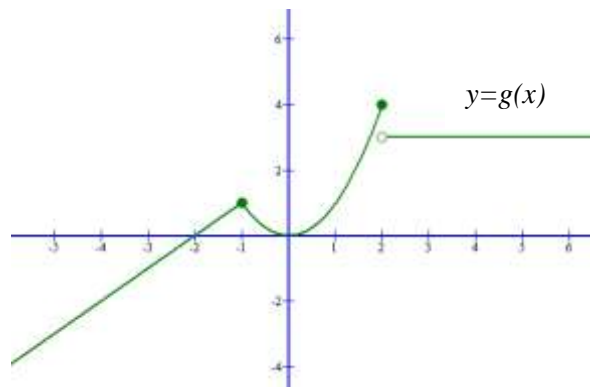
(14)   Draw the graph of a single function that has all of these properties:

- $\lim\limits_{x\to -4^+} f(x) = 2$

- $\lim\limits_{x\to 0} f(x) = 0$

- $f(-4) = 0$

- $f(0) = 2$

(15)   Compute these limits:

      a. $\lim\limits_{x \to -\infty} \dfrac{2x^3-1}{x^2+1} =$

      d. $\lim\limits_{x \to \infty} \dfrac{2x^3-1}{x^3+1} =$

      b. $\lim\limits_{x \to \infty} \dfrac{2x^3-1}{x^2+1} =$

      e. $\lim\limits_{x \to -\infty} 1 - x^4 =$

      f. $\lim\limits_{x \to \infty} 1 - x^4 =$

      c. $\lim\limits_{x \to -\infty} \dfrac{2x^3-1}{x^3+1} =$

(16)   Graph the function $g(x) = \begin{cases} -x, & \text{if } x < -2 \\ 3, & \text{if } -2 \le x \le 2 \\ x, & \text{if } x > 2 \end{cases}$ below. Then, identify and classify all

     discontinuities.

(17)   Find the value of a that makes $g(x)$ a continuous function $g(x) = \begin{cases} -x + a, & \text{if } x < 0 \\ 1, & \text{if } x = 0 \\ x + a, & \text{if } x > 0 \end{cases}$

(18)   Find values of a and b that makes $f(x)$ a continuous function: $f(x) = \begin{cases} 3x^2 - 1, & \text{if } x \ge 2 \\ ax + b, & \text{if } x < 2 \end{cases}$

(19)   Draw the graph of a single function that has all of these properties:

- $f(x)$ is continuous on the interval $(-\infty, 0) \cup (0, \infty)$
- $\lim\limits_{x \to 0} f(x) = 0$
- $f(0) = 2$
- $\lim\limits_{x \to \infty} f(x) = 0$
- $\lim\limits_{x \to -\infty} f(x) = 0$