EJERCICIOS LIMITES

1. En los ejercicios de a. a d. demostrar que: $\lim\limits_{x\to a} f(x) = L$

   (a) $f(x) = \frac{x^2-4}{x-2}, a = 2, L = 4$

   (b) $f(x) = \sqrt{x},\ a = 2,\ L = \sqrt{2}$

   (c) $f(x) = \sqrt[3]{x},\ a = 3,\ L = \sqrt[3]{3}$

   (d) $f(x) = \frac{1}{x+1},\ a = 2,\ L = \frac{1}{3}$

2. Calcule los siguientes límites, usando teoremas:

   (a) $\lim\limits_{h\to 0} \frac{\sqrt{x+h}-\sqrt{x}}{h}, x > 0$

   (b) $\lim\limits_{h\to 0} \frac{1}{h}(\frac{1}{\sqrt{1+h}} - 1)$

   (c) $\lim\limits_{h\to 0} \frac{1}{h}(\frac{1}{\sqrt{1+h}} - 1)$

   (d) $\lim\limits_{x\to 2} \frac{x^5-32}{x-2}$

   (e) $\lim\limits_{h\to 0} \frac{(1+h)^{\frac{3}{2}}-1}{h}$

   (f) $\lim\limits_{r\to 1} \sqrt{\frac{2r^2+3r-1}{r^2+1}}$

   (g) $\lim\limits_{x\to 3} \frac{x^6-729}{x+3}$

   (h) $\lim\limits_{x\to 2^-} \frac{4-x^2}{\sqrt{2+x-x^2}}$

   (i) $\lim\limits_{x\to 0^+} x\sqrt{1+\frac{1}{x^2}}$

   (j) $\lim\limits_{x\to 0} xsen(\frac{1}{x})$

3. Analizar la continuidad de las siguientes funciones:

   (a) $f(x) = \frac{x^2-4}{x^2-8x+12}, \quad 0 < x < 5,\ x \neq 2,\ f(2) = 1.$

   (b) $f(x) = \frac{x^3-1}{x^2+x-2},\ \ 0 < x < 2,\ x \neq 1,\ \ f(1) = 1$

   (c) $f(x) = \begin{cases} x-4, & -1 < x \leq 2 \\ x^2-6, & 2 < x < 5 \end{cases}$

(d) $f(x) = \begin{cases} \frac{x^2-1}{x^4-1}, & -1 < x < 2, x \neq 1 \\ x^2 + 3x - 2, & 2 \leq x < 5 \end{cases}$

(e) $f(x) = \begin{cases} \frac{x-2}{|x-2|}, & x \neq 2 \\ 0, & x = 2 \end{cases}$

(f) $f(x) = \begin{cases} \frac{x^2-x-6}{x-3}, & x \neq 3 \\ 5, & x = 3 \end{cases}$

(g) $f(x) = \begin{cases} sen(\frac{\pi}{x}), & -1 < x < 1, x \neq 0 \\ 0, & x = 0 \end{cases}$