Examen de Matemáticas 2ºBachillerato(CN)

Diciembre 2009

Calcular los siguientes límites:

1. $\lim_{x \longrightarrow 3} \left(\frac{x}{3}\right)^{\frac{2}{x-3}}$
2. $\lim_{x \longrightarrow 1} \frac{\ln x^3}{x^2-1}$
3. $\lim_{x \longrightarrow 0} \frac{e^x - e^{-x}}{5 \sin x}$
4. $\lim_{x \longrightarrow 0} \left(\frac{1}{\ln(1+x)} - \frac{1}{x}\right)$
5. $\lim_{x \longrightarrow 1} \frac{\sqrt{x} - \sqrt{2x-1}}{x-1}$
6. $\lim_{x \longrightarrow 2} \frac{x^2+5x-14}{x^2+x-6}$
7. $\lim_{x \longrightarrow \infty} \left(\frac{4x-5}{4x-1}\right)^{2x+1}$
8. $\lim_{x \longrightarrow \infty} \left(\sqrt{2x^2-x+1} - \sqrt{2x^2+3}\right)$
9. $\lim_{x \longrightarrow 0} \frac{\sin(2x)}{2x - \sin x}$
10. $\lim_{x \longrightarrow \infty} \frac{\sqrt{2x^2+5}}{3x-2}$

Solución:

1. $\lim_{x \longrightarrow 3} \left(\frac{x}{3}\right)^{\frac{2}{x-3}} = e^{2/3}$
2. $\lim_{x \longrightarrow 1} \frac{\ln x^3}{x^2-1} = \frac{3}{2}$
3. $\lim_{x \longrightarrow 0} \frac{e^x - e^{-x}}{5 \sin x} = \frac{2}{5}$
4. $\lim_{x \longrightarrow 0} \left(\frac{1}{\ln(1+x)} - \frac{1}{x}\right) = \frac{1}{2}$

5. $\lim\limits_{x \longrightarrow 1} \dfrac{\sqrt{x} - \sqrt{2x-1}}{x-1} = -\dfrac{1}{2}$

6. $\lim\limits_{x \longrightarrow 2} \dfrac{x^2 + 5x - 14}{x^2 + x - 6} = \dfrac{9}{5}$

7. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{4x-5}{4x-1}\right)^{2x+1} = e^{-2}$

8. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{2x^2 - x + 1} - \sqrt{2x^2 + 3}\right) = -\dfrac{\sqrt{2}}{4}$

9. $\lim\limits_{x \longrightarrow 0} \dfrac{\sin(2x)}{2x - \sin x} = 2$

10. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{2x^2 + 5}}{3x - 2} = \dfrac{\sqrt{2}}{3}$