Examen de Matemáticas 2º de Bachillerato CS

Noviembre 2016

Problema 1 Calcular los siguientes límites:

1. $\lim_{x \longrightarrow \infty} (-7x^4 + 2x^3 + 6x^2 - 2x + 1)$
2. $\lim_{x \longrightarrow \infty} \dfrac{3x^4 + 6x^2 - x + 3}{3x^5 - 5x - 2}$
3. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{5x^4 - x^2 + 2x + 3}}{-3x^2 - 1}$
4. $\lim_{x \longrightarrow \infty} \left(\sqrt{7x^2 - 9x + 1} - \sqrt{7x^2 + 2x - 1}\right)$
5. $\lim_{x \longrightarrow 1} \dfrac{6x^4 - 9x^2 - 2x + 5}{4x^5 - 2x - 2}$
6. $\lim_{x \longrightarrow 2} \dfrac{x^4 - 7x^2 + 4x + 4}{x^5 - x^3 - 15x + 6}$
7. $\lim_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{6x + 9}}{x - 7}$
8. $\lim_{x \longrightarrow 6} \dfrac{\sqrt{2x^2 + 1} - \sqrt{12x + 1}}{x - 6}$
9. $\lim_{x \longrightarrow \infty} \left(\dfrac{x^2 - 5x + 1}{x^2}\right)^{x-1}$
10. $\lim_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 8x + 12}{6x^2 + x - 1}\right)^{x^2-5}$
11. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{9x^2 - 5x + 2}}{-3x + 1}$
12. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{-2x^7 + 5x - 8}}{x^2 + x - 5}$
13. $\lim_{x \longrightarrow 0} \dfrac{7x^5 - 5x^2 + 3x}{7x}$
14. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-8x^6 - 3x + 5}}{3x^2 + 1}$
15. $\lim_{x \longrightarrow \infty} \left(\sqrt{5x^2 - 9x + 3} + \sqrt{x^2 - x + 8}\right)$

Solución:

1. $\lim\limits_{x \longrightarrow \infty} (-7x^4 + 2x^3 + 6x^2 - 2x + 1) = -\infty$
2. $\lim\limits_{x \longrightarrow \infty} \dfrac{3x^4 + 6x^2 - x + 3}{3x^5 - 5x - 2} = 0$
3. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{5x^4 - x^2 + 2x + 3}}{-3x^2 - 1} = -\dfrac{\sqrt{5}}{3}$
4. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{7x^2 - 9x + 1} - \sqrt{7x^2 + 2x - 1}\right) = -\dfrac{11\sqrt{7}}{14}$
5. $\lim\limits_{x \longrightarrow 1} \dfrac{6x^4 - 9x^2 - 2x + 5}{4x^5 - 2x - 2} = \dfrac{2}{9}$
6. $\lim\limits_{x \longrightarrow 2} \dfrac{x^4 - 7x^2 + 4x + 4}{x^5 - x^3 - 15x + 6} = \dfrac{8}{53}$
7. $\lim\limits_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{6x + 9}}{x - 7} = \dfrac{4\sqrt{51}}{51}$
8. $\lim\limits_{x \longrightarrow 6} \dfrac{\sqrt{2x^2 + 1} - \sqrt{12x + 1}}{x - 6} = \dfrac{6\sqrt{73}}{73}$
9. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{x^2 - 5x + 1}{x^2}\right)^{x-1} = e^{-5}$
10. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 8x + 12}{6x^2 + x - 1}\right)^{x^2-5} = 0$
11. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{9x^2 - 5x + 2}}{-3x + 1} = -1$
12. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{-2x^7 + 5x - 8}}{x^2 + x - 5}$ No existe
13. $\lim\limits_{x \longrightarrow 0} \dfrac{7x^5 - 5x^2 + 3x}{7x} = \dfrac{3}{7}$
14. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-8x^6 - 3x + 5}}{3x^2 + 1} = -\dfrac{2}{3}$
15. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{5x^2 - 9x + 3} + \sqrt{x^2 - x + 8}\right) = \infty$