Examen de Matemáticas 2º de Bachillerato CS

Diciembre 2018

Problema 1 Calcular los siguientes límites:

1. $\lim_{x \longrightarrow \infty} (-6x^4 - x^3 + 5x^2 - 5x + 1)$
2. $\lim_{x \longrightarrow \infty} \dfrac{3x^4 + 2x^2 + 5x + 3}{x^5 + x - 2}$
3. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{3x^4 + 8x^2 - 2x - 3}}{-3x^2 + 1}$
4. $\lim_{x \longrightarrow \infty} \left(\sqrt{5x^2 - x + 1} - \sqrt{5x^2 + 7x + 9}\right)$
5. $\lim_{x \longrightarrow 1} \dfrac{7x^4 + 4x^3 - 8x^2 - x - 2}{x^3 - 7x^2 + 2x + 4}$
6. $\lim_{x \longrightarrow 2} \dfrac{2x^4 - 7x^2 - x - 2}{x^5 - 9x^2 + x + 2}$
7. $\lim_{x \longrightarrow 7} \dfrac{\sqrt{x^2 - 2} - \sqrt{6x + 5}}{x - 7}$
8. $\lim_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 - 3} - \sqrt{9x + 2}}{x - 5}$
9. $\lim_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 2x + 1}{5x^2}\right)^{x-2}$
10. $\lim_{x \longrightarrow \infty} \left(\dfrac{3x^2 + 10x + 8}{6x^2 - 11x - 1}\right)^{x^2-13}$
11. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{16x^2 + 9x - 5}}{-2x + 6}$
12. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{-5x^8 + 5x - 1}}{x^2 - 3x - 5}$
13. $\lim_{x \longrightarrow 0} \dfrac{4x^5 - 5x^2 + 3x}{7x}$
14. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-8x^6 + 3x - 1}}{2x^2 + 9}$
15. $\lim_{x \longrightarrow \infty} \left(\sqrt{9x^2 - 5x + 2} + \sqrt{9x^2 - 4x + 2}\right)$

Solución:

1. $\lim\limits_{x \longrightarrow \infty} (-6x^4 - x^3 + 5x^2 - 5x + 1) = -\infty$
2. $\lim\limits_{x \longrightarrow \infty} \dfrac{3x^4 + 2x^2 + 5x + 3}{x^5 + x - 2} = 0$
3. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{3x^4 + 8x^2 - 2x - 3}}{-3x^2 + 1} = -\dfrac{\sqrt{3}}{3}$
4. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{5x^2 - x + 1} - \sqrt{5x^2 + 7x + 9}\right) = -\dfrac{4\sqrt{5}}{5}$
5. $\lim\limits_{x \longrightarrow 1} \dfrac{7x^4 + 4x^3 - 8x^2 - x - 2}{x^3 - 7x^2 + 2x + 4} = -\dfrac{23}{9}$
6. $\lim\limits_{x \longrightarrow 2} \dfrac{2x^4 - 7x^2 - x - 2}{x^5 - 9x^2 + x + 2} = \dfrac{7}{9}$
7. $\lim\limits_{x \longrightarrow 7} \dfrac{\sqrt{x^2 - 2} - \sqrt{6x + 5}}{x - 7} = \dfrac{4\sqrt{47}}{47}$
8. $\lim\limits_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 - 3} - \sqrt{9x + 2}}{x - 5} = \dfrac{11\sqrt{47}}{94}$
9. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 2x + 1}{5x^2}\right)^{x-2} = e^{-2/5}$
10. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{3x^2 + 10x + 8}{6x^2 - 11x - 1}\right)^{x^2-13} = 0$
11. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{16x^2 + 9x - 5}}{-2x + 6} = -2$
12. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{-5x^8 + 5x - 1}}{x^2 - 3x - 5}$ No existe
13. $\lim\limits_{x \longrightarrow 0} \dfrac{4x^5 - 5x^2 + 3x}{7x} = \dfrac{3}{7}$
14. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-8x^6 + 3x - 1}}{2x^2 + 9} = -1$
15. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{9x^2 - 5x + 2} + \sqrt{9x^2 - 4x + 2}\right) = \infty$