Examen de Matemáticas 2º de Bachillerato CS

Diciembre 2017

Problema 1 Calcular los siguientes límites:

1. $\lim_{x \longrightarrow \infty} (-3x^4 + 4x^3 + x^2 - 5x + 1)$
2. $\lim_{x \longrightarrow \infty} \dfrac{2x^4 + 5x^2 - 2x + 3}{x^5 - 3x - 2}$
3. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{3x^4 - 3x^2 - 2x + 3}}{-3x^2 + 5}$
4. $\lim_{x \longrightarrow \infty} \left(\sqrt{5x^2 + 6x + 1} - \sqrt{5x^2 - x + 9}\right)$
5. $\lim_{x \longrightarrow 1} \dfrac{7x^4 + 2x^3 - 9x^2 + 3x - 3}{x^3 - 5x^2 + 5x - 1}$
6. $\lim_{x \longrightarrow 2} \dfrac{x^4 - 3x^2 - 4x + 4}{x^5 - 3x^3 - 5x + 2}$
7. $\lim_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{8x - 5}}{x - 7}$
8. $\lim_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 + 1} - \sqrt{10x + 1}}{x - 5}$
9. $\lim_{x \longrightarrow \infty} \left(\dfrac{3x^2 - x + 1}{3x^2}\right)^{x-1}$
10. $\lim_{x \longrightarrow \infty} \left(\dfrac{3x^2 - 9x + 1}{6x^2 + 8x - 1}\right)^{x^2+9}$
11. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{16x^2 - 8x + 5}}{-2x + 1}$
12. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{-5x^7 + 3x - 1}}{x^2 + 2x - 5}$
13. $\lim_{x \longrightarrow 0} \dfrac{6x^5 - 3x^2 + 2x}{5x}$
14. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-27x^6 - 2x + 5}}{2x^2 - 5}$
15. $\lim_{x \longrightarrow \infty} \left(\sqrt{7x^2 + 8x + 3} + \sqrt{7x^2 - x + 2}\right)$

Solución:

1. $\lim\limits_{x \longrightarrow \infty} (-3x^4 + 4x^3 + x^2 - 5x + 1) = -\infty$
2. $\lim\limits_{x \longrightarrow \infty} \dfrac{2x^4 + 5x^2 - 2x + 3}{x^5 - 3x - 2} = 0$
3. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{3x^4 - 3x^2 - 2x + 3}}{-3x^2 + 5} = -\dfrac{\sqrt{3}}{3}$
4. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{5x^2 + 6x + 1} - \sqrt{5x^2 - x + 9}\right) = -\dfrac{7\sqrt{5}}{10}$
5. $\lim\limits_{x \longrightarrow 1} \dfrac{7x^4 + 2x^3 - 9x^2 + 3x - 3}{x^3 - 5x^2 + 5x - 1} = -\dfrac{19}{2}$
6. $\lim\limits_{x \longrightarrow 2} \dfrac{x^4 - 3x^2 - 4x + 4}{x^5 - 3x^3 - 5x + 2} = \dfrac{16}{39}$
7. $\lim\limits_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{8x - 5}}{x - 7} = \dfrac{\sqrt{51}}{17}$
8. $\lim\limits_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 + 1} - \sqrt{10x + 1}}{x - 5} = \dfrac{5\sqrt{51}}{51}$
9. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{3x^2 - x + 1}{3x^2}\right)^{x-1} = e^{-1/3}$
10. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{3x^2 - 9x + 1}{6x^2 + 8x - 1}\right)^{x^2+9} = 0$
11. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{16x^2 - 8x + 5}}{-2x + 1} = -2$
12. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{-5x^7 + 3x - 1}}{x^2 + 2x - 5}$ No existe
13. $\lim\limits_{x \longrightarrow 0} \dfrac{6x^5 - 3x^2 + 2x}{5x} = \dfrac{6}{5}$
14. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-27x^6 - 2x + 5}}{2x^2 - 5} = -\dfrac{3}{2}$
15. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{7x^2 + 8x + 3} + \sqrt{7x^2 - x + 2}\right) = \infty$