Examen de Matemáticas 1º de Bachillerato CS

Diciembre 2018

Problema 1 Calcular los siguientes límites:

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

Solución:

1. $\lim\limits_{x \longrightarrow \infty} (-7x^4 + 2x^3 - x^2 + x - 3) = -\infty$
2. $\lim\limits_{x \longrightarrow \infty} \dfrac{5x^4 - 2x^2 - x - 4}{3x^5 - 2x + 1} = 0$
3. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{7x^4 - 7x^2 + x + 2}}{-3x^2 + 8} = -\dfrac{\sqrt{7}}{3}$
4. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{5x^2 - 2x + 1} - \sqrt{5x^2 + 3x - 1}\right) = -\dfrac{\sqrt{5}}{2}$
5. $\lim\limits_{x \longrightarrow 1} \dfrac{5x^4 + 3x^3 - 11x^3 + 2x + 1}{2x^3 - 4x^2 + x + 1} = 2$
6. $\lim\limits_{x \longrightarrow 2} \dfrac{3x^3 - 5x^2 + 2x - 8}{2x^3 - 3x^2 + x - 6} = \dfrac{18}{13}$
7. $\lim\limits_{x \longrightarrow 7} \dfrac{\sqrt{x^2 - 2} - \sqrt{6x + 5}}{x - 7} = \dfrac{4\sqrt{47}}{47}$
8. $\lim\limits_{x \longrightarrow 5} \dfrac{\sqrt{x^2 - 6} - \sqrt{3x + 4}}{x - 5} = \dfrac{7\sqrt{19}}{38}$
9. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 2x + 1}{5x^2 - 3}\right)^{7x} = e^{-14/5}$
10. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{2x^2 - 7x + 8}{5x^2 - x + 1}\right)^{7x^2 + 2} = 0$
11. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{3x^2 - 2x + 3}}{-2x + 1} = -\dfrac{\sqrt{3}}{2}$
12. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{-7x^3 + 2x^2 - 2x + 5}}{3x^2 - 5}$ No existe
13. $\lim\limits_{x \longrightarrow 0} \dfrac{4x^5 + 3x^4 - 2x^2 + 5x}{10x} = \dfrac{1}{2}$
14. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-4x^6 + 3x - 1}}{2x^2 - 5} = -\dfrac{\sqrt[3]{4}}{2}$
15. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{8x^2 + 9x + 1} + \sqrt{8x^2 - 3x + 5}\right) = \infty$