# Examen de Matemáticas 2º de Bachillerato CS

**Diciembre 2019**

**Problema 1** Calcular los siguientes límites:

1. $\lim_{x \longrightarrow \infty} (-3x^4 + 3x^3 - x^2 - 5x + 8)$
2. $\lim_{x \longrightarrow \infty} \dfrac{5x^4 - x^2 + 4x + 3}{-x^5 + 6x - 2}$
3. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{2x^4 - 7x^2 + 3x - 3}}{-3x^2 + 5}$
4. $\lim_{x \longrightarrow \infty} \left(\sqrt{3x^2 - 6x + 1} - \sqrt{3x^2 + 4x + 5}\right)$
5. $\lim_{x \longrightarrow 1} \dfrac{8x^4 + 6x^3 - 7x^2 - 8x + 1}{3x^3 - 7x^2 + 6x - 2}$
6. $\lim_{x \longrightarrow 2} \dfrac{2x^3 - 3x^2 + x - 6}{x^5 - 8x^2 + x - 2}$
7. $\lim_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{6x + 9}}{x - 7}$
8. $\lim_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 + 1} - \sqrt{9x + 6}}{x - 5}$
9. $\lim_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 7x + 3}{5x^2}\right)^{x-2}$
10. $\lim_{x \longrightarrow \infty} \left(\dfrac{2x^2 + 13x + 4}{5x^2 - 14x - 3}\right)^{3x^2-3}$
11. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{36x^2 - 5x + 6}}{-2x + 1}$
12. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt{-2x^8 + 3x - 1}}{2x^2 + x - 5}$
13. $\lim_{x \longrightarrow 0} \dfrac{3x^5 - 4x^2 + 2x}{4x}$
14. $\lim_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-27x^6 + 2x - 5}}{3x^2 + 9}$
15. $\lim_{x \longrightarrow \infty} \left(\sqrt{9x^2 + 6x - 5} + \sqrt{9x^2 - 2x + 8}\right)$

**Solución:**

1. $\lim\limits_{x \longrightarrow \infty} (-3x^4 + 3x^3 - x^2 - 5x + 8) = -\infty$
2. $\lim\limits_{x \longrightarrow \infty} \dfrac{5x^4 - x^2 + 4x + 3}{-x^5 + 6x - 2} = 0$
3. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{2x^4 - 7x^2 + 3x - 3}}{-3x^2 + 5} = -\dfrac{\sqrt{2}}{3}$
4. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{3x^2 - 6x + 1} - \sqrt{3x^2 + 4x + 5}\right) = -\dfrac{5\sqrt{3}}{3}$
5. $\lim\limits_{x \longrightarrow 1} \dfrac{8x^4 + 6x^3 - 7x^2 - 8x + 1}{3x^3 - 7x^2 + 6x - 2} = 28$
6. $\lim\limits_{x \longrightarrow 2} \dfrac{2x^3 - 3x^2 + x - 6}{x^5 - 8x^2 + x - 2} = \dfrac{13}{49}$
7. $\lim\limits_{x \longrightarrow 7} \dfrac{\sqrt{x^2 + 2} - \sqrt{6x + 9}}{x - 7} = \dfrac{4\sqrt{51}}{51}$
8. $\lim\limits_{x \longrightarrow 5} \dfrac{\sqrt{2x^2 + 1} - \sqrt{9x + 6}}{x - 5} = \dfrac{11\sqrt{51}}{102}$
9. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{5x^2 - 7x + 3}{5x^2}\right)^{x-2} = e^{-7/5}$
10. $\lim\limits_{x \longrightarrow \infty} \left(\dfrac{2x^2 + 13x + 4}{5x^2 - 14x - 3}\right)^{3x^2 - 3} = 0$
11. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{36x^2 - 5x + 6}}{-2x + 1} = -3$
12. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt{-2x^8 + 3x - 1}}{2x^2 + x - 5}$ No existe
13. $\lim\limits_{x \longrightarrow 0} \dfrac{3x^5 - 4x^2 + 2x}{4x} = \dfrac{3}{4}$
14. $\lim\limits_{x \longrightarrow \infty} \dfrac{\sqrt[3]{-27x^6 + 2x - 5}}{3x^2 + 9} = -1$
15. $\lim\limits_{x \longrightarrow \infty} \left(\sqrt{9x^2 + 6x - 5} + \sqrt{9x^2 - 2x + 8}\right) = \infty$