

Problema 1 Calcular los siguientes límites:

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

Solución:

1. $\lim_{x \rightarrow \infty} (-3x^4 + 5x^3 - 7x^2 + 2x + 1) = -\infty$
2. $\lim_{x \rightarrow \infty} \frac{8x^4 - 7x^2 - 4x + 3}{5x^5 - 3x - 2} = 0$
3. $\lim_{x \rightarrow \infty} \frac{\sqrt{8x^4 - 3x^2 + 5x + 3}}{-3x^2 + 2} = -\frac{2\sqrt{2}}{3}$
4. $\lim_{x \rightarrow \infty} \left(\sqrt{6x^2 - 5x + 1} - \sqrt{6x^2 + 2x - 1} \right) = -\frac{7\sqrt{6}}{12}$
5. $\lim_{x \rightarrow 1} \frac{8x^4 - 7x^2 - 4x + 3}{5x^5 - 3x - 2} = \frac{7}{11}$
6. $\lim_{x \rightarrow 2} \frac{2x^4 - 7x^2 - 4x + 4}{x^5 - 15x - 2} = \frac{32}{65}$
7. $\lim_{x \rightarrow 9} \frac{\sqrt{x^2 - 2} - \sqrt{8x + 7}}{x - 9} = \frac{5\sqrt{79}}{79}$
8. $\lim_{x \rightarrow 6} \frac{\sqrt{2x^2 - 1} - \sqrt{11x + 5}}{x - 6} = \frac{13\sqrt{71}}{142}$
9. $\lim_{x \rightarrow \infty} \left(\frac{x^2 + 3x - 1}{x^2} \right)^{x+1} = e^3$
10. $\lim_{x \rightarrow \infty} \left(\frac{2x^2 + 5x - 9}{7x^2 - 6} \right)^{x^2+1} = 0$
11. $\lim_{x \rightarrow \infty} \frac{\sqrt{7x^2 - 3x + 8}}{-3x + 5} = -\frac{\sqrt{7}}{3}$
12. $\lim_{x \rightarrow \infty} \frac{\sqrt{-7x^7 + x - 8}}{x^2 + 5}$ No existe
13. $\lim_{x \rightarrow 0} \frac{3x^5 - 2x^2 - x}{4x} = -\frac{1}{4}$
14. $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{-2x^6 + 3x - 1}}{2x^2 - 3} = -\frac{\sqrt[3]{2}}{3}$
15. $\lim_{x \rightarrow \infty} \left(\sqrt{2x^2 - 3x + 1} + \sqrt{x^2 + 2x - 5} \right) = \infty$