

Examen de Matemáticas 1º de Bachillerato

Límites

Junio 2003

Calcular los siguientes límites:

$$1. \lim_{x \rightarrow \infty} \frac{3x^2 + x - 1}{2x^2 + 1} = \frac{3}{2}$$

$$2. \lim_{x \rightarrow \infty} \frac{-3x - 1}{x^5 + x^4 + 1} = 0$$

$$3. \lim_{x \rightarrow \infty} \left(\frac{3x^2 - 1}{x^2} \right)^{2x^2 + 1} = \infty$$

$$4. \lim_{x \rightarrow \infty} \left(\frac{x^3 - 1}{x^3 + 3} \right)^{2x^3} = e^{-8}$$

$$5. \lim_{x \rightarrow \infty} \left(\frac{3x^4 + x - 1}{3x^4 + 1} \right)^{x^3} = e^{1/3}$$

$$6. \lim_{x \rightarrow \infty} \left(\frac{2x^3 + 1}{3x^3 + x^2 - 1} \right)^{2x-1} = 0$$

$$7. \lim_{x \rightarrow \infty} \left(\frac{x^3 + x + 1}{2x^3 - 1} \right)^{3x} = 0$$

$$8. \lim_{x \rightarrow \infty} \left(\frac{2x - 1}{2x + 1} \right)^{2x} = e^{-2}$$

$$9. \lim_{x \rightarrow 1} \frac{x^5 + x^4 - 3x^2 + 4x - 1}{x^4 - x^3 - 2x^2 + x + 1} = \frac{1}{2}$$

$$10. \lim_{x \rightarrow 0} \frac{x^3 - 2x^2 - x}{x^4 - 3x^2 + x} = -1$$

$$11. \lim_{x \rightarrow 3} \frac{x - \sqrt{x+6}}{x - 3} = \frac{5}{6}$$

$$12. \lim_{x \rightarrow 1} \frac{x - 1}{x - \sqrt{2 - x}} = \frac{2}{3}$$

Por L'Hôpital:

$$13. \lim_{x \rightarrow \infty} \frac{\ln x}{x} = 0$$

$$14. \lim_{x \rightarrow 0} \frac{e^x - \cos x}{\sin x} = 1$$

$$15. \lim_{x \rightarrow \infty} \frac{x^2 - \sqrt{x}}{x^2} = 1$$

$$16. \lim_{x \rightarrow 0} \frac{x^2 - x}{e^x - 1} = -1$$

$$17. \lim_{x \rightarrow 1} \frac{x^4 - x^3 + 3x^2 - 4x + 1}{x^4 - x^3 + 3x - 3} = \frac{3}{4}$$

$$18. \lim_{x \rightarrow 2} \frac{x - \sqrt{x+2}}{x - 2} = \frac{3}{4}$$

$$19. \lim_{x \rightarrow 0} \frac{\sin^2 x}{x^2} = 1$$

$$20. \lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin x} = 0$$