

Simulazione di verifica

Periodo 3 - UdA 2

Trovare i seguenti limiti (senza specificare il segno se il limite è infinito)

$$[1] \quad \lim_{x \rightarrow -3} \frac{-2x-1}{x^2+1}$$

$$[2] \quad \lim_{x \rightarrow -2} \frac{x+3}{-3x-3}$$

$$[3] \quad \lim_{x \rightarrow 0} \frac{3x^3+x^2-x+2}{3x^2-2x}$$

$$[4] \quad \lim_{x \rightarrow 0} \frac{x^3-3x-4}{3x^3+2x^2-x-6}$$

$$[5] \quad \lim_{x \rightarrow 1} \frac{2x^2-5x+3}{x^3+x^2-x-2}$$

$$[6] \quad \lim_{x \rightarrow 2} \frac{x^2+3x}{2x^3-3x^2-x-1}$$

Trovare i seguenti limiti (senza specificare il segno se il limite è infinito) svolgendo dettagliatamente i calcoli

$$[7] \quad \lim_{x \rightarrow \infty} 4x^3 + 3x - 5$$

$$[8] \quad \lim_{x \rightarrow \infty} 5x^2 - x + 3$$

$$[9] \quad \lim_{x \rightarrow \infty} 6x^3 - x^2 + 5x$$

$$[10] \quad \lim_{x \rightarrow \infty} x^2 + 8x - 3$$

$$[11] \quad \lim_{x \rightarrow \infty} 3x^3 + 2x^2 - 4$$

$$[12] \quad \lim_{x \rightarrow \infty} x^3 - 4x^2 - 3x - 2$$

Trovare i seguenti limiti (senza specificare il segno se il limite è infinito) equiparandole a rapporti tra monomi e poi svolgendo dettagliatamente i calcoli

$$[13] \quad \lim_{x \rightarrow \infty} \frac{3x^3-x^2-x+2}{5x}$$

$$[14] \quad \lim_{x \rightarrow \infty} \frac{4x^3+3x^2+3}{6x^3+x^2-2x+2}$$

$$[15] \quad \lim_{x \rightarrow \infty} \frac{2x^3}{3x^2-2x+5}$$

$$[16] \quad \lim_{x \rightarrow \infty} \frac{2x^3+x+3}{3x^3-x^2-x-2}$$

$$[17] \quad \lim_{x \rightarrow \infty} \frac{2x^2-5x+1}{3x^3}$$

$$[18] \quad \lim_{x \rightarrow \infty} \frac{-x}{2x^3+x^2-x-3}$$

Trovare gli elementi caratterizzanti delle seguenti funzioni

$$[19] \quad \frac{-2x^2+4x-2}{-3x^3+12x^2-12x}$$

$$[20] \quad \frac{-2x^2+18}{x^4+3x^3+2x^2}$$

$$[21] \quad \frac{4x^2+4}{-3x^3-9x^2-6x}$$

SOLUZIONI

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$$\textcolor{red}{[1]} \quad \frac{1}{2} \quad \textcolor{red}{[2]} \quad \frac{1}{3} \quad \textcolor{red}{[3]} \quad \infty \quad \textcolor{red}{[4]} \quad \frac{2}{3} \quad \textcolor{red}{[5]} \quad 0 \quad \textcolor{red}{[6]} \quad 10$$

$$7. \quad \underset{\infty}{4x^3} \left(\frac{4x^3}{4x^3} + \frac{3x}{4x^3} - \frac{5}{4x^3} \right) = 4x^3 \left(1 + \frac{3}{4x^2} - \frac{5}{4x^3} \right) \longrightarrow 4\infty^3 \left(1 + \frac{3}{4\infty^2} - \frac{5}{4\infty^3} \right) = 4\infty^3 (1 + 0 - 0) = \infty \cdot 1 =$$

$$8. \quad \underset{\infty}{5x^2} \left(\frac{5x^2}{5x^2} - \frac{x}{5x^2} + \frac{3}{5x^2} \right) = 5x^2 \left(1 - \frac{1}{5x} + \frac{3}{5x^2} \right) \longrightarrow 5\infty^2 \left(1 - \frac{1}{5\infty} + \frac{3}{5\infty^2} \right) = 5\infty^2 (1 - 0 + 0) = \infty \cdot 1 =$$

$$9. \quad \underset{\infty}{6x^3} \left(\frac{6x^3}{6x^3} - \frac{x^2}{6x^3} + \frac{5x}{6x^3} \right) = 6x^3 \left(1 - \frac{1}{6x} + \frac{5}{6x^2} \right) \longrightarrow 6\infty^3 \left(1 - \frac{1}{6\infty} + \frac{5}{6\infty^2} \right) = 6\infty^3 (1 - 0 + 0) = \infty \cdot 1 =$$

$$10. \quad x^2 \left(\frac{x^2}{x^2} + \frac{8x}{x^2} - \frac{3}{x^2} \right) = x^2 \left(1 + \frac{8}{x} - \frac{3}{x^2} \right) \longrightarrow \infty^2 \left(1 + \frac{8}{\infty} - \frac{3}{\infty^2} \right) = \infty^2 (1 + 0 - 0) = \infty \cdot 1 = \infty$$

$$11. \quad \underset{\infty}{3x^3} \left(\frac{3x^3}{3x^3} + \frac{2x^2}{3x^3} - \frac{4}{3x^3} \right) = 3x^3 \left(1 + \frac{2}{3x} - \frac{4}{3x^3} \right) \longrightarrow 3\infty^3 \left(1 + \frac{2}{3\infty} - \frac{4}{3\infty^3} \right) = 3\infty^3 (1 + 0 - 0) = \infty \cdot 1 =$$

$$12. \quad \underset{\infty}{x^3} \left(\frac{x^3}{x^3} - \frac{4x^2}{x^3} - \frac{3x}{x^3} - \frac{2}{x^3} \right) = x^3 \left(1 - \frac{4}{x} - \frac{3}{x^2} - \frac{2}{x^3} \right) \longrightarrow \infty^3 \left(1 - \frac{4}{\infty} - \frac{3}{\infty^2} - \frac{2}{\infty^3} \right) = \infty^3 (1 - 0 - 0 - 0) = \infty \cdot 1 = \infty$$

$$13. \quad \frac{3x^3 - x^2 - x + 2}{5x} \approx \frac{3x^3}{5x} = \frac{3x^2}{5} \longrightarrow \frac{3\infty^2}{5} = \infty$$

$$14. \quad \frac{4x^3 + 3x^2 + 3}{6x^3 + x^2 - 2x + 2} \approx \frac{4x^3}{6x^3} = \frac{2}{3}$$

$$15. \quad \frac{2x^3}{3x^2 - 2x + 5} \approx \frac{2x^3}{3x^2} = \frac{2x}{3} \longrightarrow \frac{2\infty}{3} = \infty$$

$$16. \quad \frac{2x^3 + x + 3}{3x^3 - x^2 - x - 2} \approx \frac{2x^3}{3x^3} = \frac{2}{3}$$

$$17. \quad \frac{2x^2 - 5x + 1}{3x^3} \approx \frac{2x^2}{3x^3} = \frac{2}{3x} \longrightarrow \frac{2}{3\infty} = 0$$

$$18. \quad \frac{-x}{2x^3 + x^2 - x - 3} \approx -\frac{x}{2x^3} = -\frac{1}{2x^2} \longrightarrow -\frac{1}{2\infty^2} = 0$$

$$19. \quad \lim_{x \rightarrow 0^\pm} f(x) = \pm\infty \quad f(1) = 0 \quad \lim_{x \rightarrow 2} f(x) = +\infty \quad \lim_{x \rightarrow \infty} f(x) = 0$$

$$20. \quad f(-3) = 0 \quad \lim_{x \rightarrow -2^\mp} f(x) = \pm\infty \quad \lim_{x \rightarrow -1^\pm} f(x) = \pm\infty \quad \lim_{x \rightarrow 0} f(x) = +\infty \quad f(3) = 0 \quad \lim_{x \rightarrow \infty} f(x) = 0$$

$$21. \quad \lim_{x \rightarrow -2^\mp} f(x) = \pm\infty \quad \lim_{x \rightarrow -1^\pm} f(x) = \pm\infty \quad \lim_{x \rightarrow 0^\mp} f(x) = \pm\infty \quad \lim_{x \rightarrow \infty} f(x) = 0$$