

Esercizi 3.

22/10/2012

Esercizio 1

- (a) $\lim_{x \rightarrow 3} \frac{x^2 - 3x}{x^2 - 2x - 3}$
- (b) $\lim_{x \rightarrow -1} \frac{x^2 - 1}{x^3 + 2x^2 + 3x + 2}$
- (c) $\lim_{x \rightarrow 1^+} \frac{x^2 - 6x + 5}{x^3 - 3x + 2}$
- (d) $\lim_{x \rightarrow 1^-} \frac{x^2 - 6x + 5}{x^3 - 3x + 2}$
- (e) $\lim_{x \rightarrow -2} \frac{x^4 + 5x^3 + 6x^2 - 4x - 8}{x^4 + 4x^3 + 4x^2}$

Esercizio 2

- (a) $\lim_{x \rightarrow \infty} \frac{5x^2 - 3x}{4x^2 + 2x + 3}$
- (b) $\lim_{x \rightarrow \infty} \frac{x^2 - 8}{2x^3 - x + 9}$
- (c) $\lim_{x \rightarrow -\infty} \frac{x^5 + 3x^3 + 7}{2x^3 - 2x + 4}$
- (d) $\lim_{x \rightarrow -\infty} \frac{1 - x}{1 + x}$
- (e) $\lim_{x \rightarrow 4} \frac{x + 4 + \frac{2x+3}{x-4}}{1 + x - \frac{x^2}{x-4}}$
- (f) $\lim_{x \rightarrow 0} \frac{\frac{1}{x} + 1 + \frac{2}{x+1}}{1 + \frac{x+2}{x^2} - \frac{x}{x-5}}$

Esercizio 3

- (a) $\lim_{x \rightarrow -\infty} \frac{\sqrt{3x^2 - 5}}{\sqrt{12x^2 - x + 6}}$
- (b) $\lim_{x \rightarrow \infty} \frac{\sqrt{x} + \sqrt[3]{x}}{\sqrt{x} - \sqrt[3]{x}}$
- (c) $\lim_{x \rightarrow \infty} \frac{\sqrt{x} + 2\sqrt[3]{x^2}}{3\sqrt{x} - 4\sqrt[3]{x^5}}$
- (d) $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 5} + \sqrt[3]{x^2 + 5}}{\sqrt{2x^2 - 7} - \sqrt[3]{3x^2 + x}}$

Esercizio 4

- (a) $\lim_{x \rightarrow \infty} \frac{1}{\sqrt{x-1} - \sqrt{x+1}}$

$$\begin{aligned}
(b) \quad & \lim_{x \rightarrow 0^-} \frac{1 - \sqrt{1-x}}{x^2} \\
(c) \quad & \lim_{x \rightarrow 1} \frac{2 - \sqrt{3x+1}}{x^2 - 1} \\
(d) \quad & \lim_{x \rightarrow 0} \frac{1 - \sqrt{x^2 + x + 1}}{x} \\
(e) \quad & \lim_{x \rightarrow -\infty} \sqrt{4x^2 + 1} - \sqrt{4x^2 + 2x - 1} \\
(f) \quad & \lim_{x \rightarrow \infty} \sqrt{x^2 + ax} - \sqrt{x^2 - ax}
\end{aligned}$$

Esercizio 5

$$\begin{aligned}
(a) \quad & \lim_{x \rightarrow +\infty} \frac{\sqrt{x^3}}{\sqrt[3]{x^2}} \\
(b) \quad & \lim_{x \rightarrow +\infty} \frac{\sqrt{x} + x}{\sqrt[3]{x^2} + \sqrt{x^5}} \\
(c) \quad & \lim_{x \rightarrow +\infty} \frac{\sqrt{x^4 + 3}}{2x^2 + 1} \\
(d) \quad & \lim_{x \rightarrow +\infty} \frac{1}{\sqrt{x^5 + 5} + \sqrt{x^3 + 3}} \\
(e) \quad & \lim_{x \rightarrow -\infty} \frac{\sqrt[3]{3x^2 + 4}}{\sqrt[3]{4x^2 + 3}}
\end{aligned}$$

Esercizio 6

$$\begin{aligned}
(a) \quad & \lim_{x \rightarrow 7} \frac{\sqrt{7} - \sqrt{x}}{x - 7} \\
(b) \quad & \lim_{x \rightarrow +\infty} \sqrt{x^4 - x^3} - \sqrt{x^4 + x^3} \\
(c) \quad & \lim_{x \rightarrow +\infty} \sqrt{x^4 - x^2} - \sqrt{x^4 + x^2} \\
(d) \quad & \lim_{x \rightarrow +\infty} \sqrt{x^4 - x} - \sqrt{x^4 + x} \\
(e) \quad & \lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 + a^2} - \sqrt{x^2 - b^2}}{\sqrt{x^2 + c^2} - \sqrt{x^2 - d^2}} \quad \text{con } d \neq 0
\end{aligned}$$

SOLUZIONI

Esercizio 1 a) $\frac{3}{4}$ b) -1 c) $-\infty$ d) $+\infty$ e) 0

Esercizio 2 a) $\frac{5}{4}$ b) 0 c) $+\infty$ d) -1 e) $-\frac{11}{16}$ f) 0

Esercizio 3 a) $\frac{1}{2}$ b) 1 c) 0 d) $\frac{1}{\sqrt{2}}$

Esercizio 4 a) $-\infty$ b) $-\infty$ c) $-\frac{3}{8}$ d) $-\frac{1}{2}$ e) $\frac{1}{2}$ f) a

Esercizio 5 a) $+\infty$ b) 0 c) $\frac{1}{2}$ d) 0 e) $\sqrt[3]{\frac{3}{4}}$

Esercizio 6 a) $-\frac{1}{2\sqrt{7}}$ b) $-\infty$ c) -1 d) 0 e) $\frac{a^2+b^2}{c^2+d^2}$