Limiti

Calcolare, se esistono, i seguenti limiti

$$\lim_{x\to 1} \frac{x^4-7x^3+17x^2-17x+6}{x^4-2x^3-15x^2+32x-16}, \qquad \lim_{x\to 2} \frac{x^3-4x^2-3x-18}{x^3-x^2-8x+12}$$

$$\lim_{x\to \frac{\pi}{2}} \frac{\cos(x)}{\cos(3x)}, \qquad \lim_{x\to \frac{\pi}{4}} \frac{(\cos(x)-\sin(x))^2}{1-\cos(x-\frac{\pi}{4})}, \qquad \lim_{x\to 0^+} \frac{1-\cos(\sqrt{x})}{\sin(x)\cos(x)},$$

$$\lim_{x\to 0} \frac{\tan^2(x)}{\left(1-\frac{1}{\cos(x)}\right)^2}, \qquad \lim_{x\to 0} \frac{\sin\left(\frac{x^4-2x^2+x}{x^2+1}\right)}{\sqrt{x^4+7x^2}}, \qquad \lim_{x\to 0} \frac{\tan(x)}{1-\frac{1}{\cos(x)}},$$

$$\lim_{x\to 0} \frac{2-2\cos(x)-\sin^2(x)}{\sin^3(x)}, \qquad \lim_{x\to 0} \frac{\cos(2x)-\cos(x^2)}{\sin^2(x)}, \qquad \lim_{x\to 0} \frac{\cos(2x)-1}{\cos^2(x)-1},$$

$$\lim_{x\to 3} \frac{\sin^2(x^2-x-5)}{1-\cos(x^2-4x+4)},$$