

$$494. \lim_{x \rightarrow 0} \frac{1 - \cos x \cos 2x \cos 3x}{1 - \cos x}.$$

$$495. \lim_{x \rightarrow \pi/3} \frac{\sin\left(x - \frac{\pi}{3}\right)}{1 - 2 \cos x}. \quad 496. \lim_{x \rightarrow \pi/3} \frac{\operatorname{tg}^3 x - 3 \operatorname{tg} x}{\cos\left(x + \frac{\pi}{6}\right)}.$$

$$497. \lim_{x \rightarrow 0} \frac{\operatorname{tg}(a+x) \operatorname{tg}(a-x) - \operatorname{tg}^2 a}{x^2}.$$

$$498. \lim_{x \rightarrow \pi/4} \frac{1 - \operatorname{ctg}^3 x}{2 - \operatorname{ctg} x - \operatorname{ctg}^3 x}.$$

$$499. \lim_{x \rightarrow 0} \frac{\sqrt{1 + \operatorname{tg} x} - \sqrt{1 + \sin x}}{x^3}.$$

$$500. \lim_{x \rightarrow 0} \frac{x^2}{\sqrt{1 + x \sin x} - \sqrt{\cos x}}.$$

$$501. \lim_{x \rightarrow 0} \frac{\sqrt{\cos x} - \sqrt[3]{\cos x}}{\sin^2 x}.$$

$$502. \lim_{x \rightarrow 0} \frac{\sqrt{1 - \cos x^2}}{1 - \cos x}. \quad 503. \lim_{x \rightarrow 0} \frac{1 - \sqrt{\cos x}}{1 - \cos(\sqrt{x})}.$$

$$504. \lim_{x \rightarrow 0} \frac{1 - \cos x \sqrt{\cos 2x} \sqrt[3]{\cos 3x}}{x^2}.$$

$$505. \lim_{x \rightarrow +\infty} (\sin \sqrt{x+1} - \sin \sqrt{x}).$$

$$506. \text{ а) } \lim_{x \rightarrow 0} \left(\frac{1+x}{2+x} \right)^{(1-\sqrt{x})/(1-x)};$$

$$\text{ б) } \lim_{x \rightarrow 1} \left(\frac{1+x}{2+x} \right)^{(1-\sqrt{x})/(1-x)}; \text{ в) } \lim_{x \rightarrow +\infty} \left(\frac{1+x}{2+x} \right)^{(1-\sqrt{x})/(1-x)}.$$

$$507. \lim_{x \rightarrow \infty} \left(\frac{x+2}{2x-1} \right)^{x^2}. \quad 508. \lim_{k \rightarrow \infty} \left(\frac{3x^2 - x + 1}{2x^2 + x + 1} \right)^{\frac{x^3}{1-x}}.$$

$$509. \lim_{n \rightarrow \infty} \left(\sin^n \frac{2\pi n}{3n+1} \right).$$

$$510. \lim_{x \rightarrow \pi/4+0} \left[\operatorname{tg} \left(\frac{\pi}{8} + x \right) \right]^{\operatorname{tg} 2x}.$$

$$511. \lim_{x \rightarrow \infty} \left(\frac{x^2-1}{x^2+1} \right)^{\frac{x-1}{x+1}}. \quad 512. \lim_{x \rightarrow \infty} \left(\frac{x^2+1}{x^2-2} \right)^{x^2}.$$