## 极限篇 1

$$(1)\lim_{x\to\alpha}\frac{\sin x - \sin\alpha}{x-\alpha}$$

$$(2)\lim_{x\to 0} (1+tan^2x)^{\cot^2x}$$

$$(1)\lim_{x\to\alpha}\frac{\sin x-\sin\alpha}{x-\alpha} \qquad \qquad (2)\lim_{x\to0}(1+\tan^2x)^{\cot^2x} \qquad \qquad (3)\lim_{x\to0}\frac{\sqrt{1+\tan x}-\sqrt{1+\sin x}}{x\sqrt{1+\sin^2x}-x}$$

$$(4)\lim_{x\to 0}\frac{tanx - sinx}{r^3}$$

$$(4) \lim_{x \to 0} \frac{tanx - sinx}{x^3} \qquad \qquad (5) \lim_{x \to 0} (\frac{a^x + b^x + c^x}{3})^{\frac{1}{x}} (a > 0, b > 0, c > 0) \qquad \qquad (6) \lim_{x \to -\infty} x(\sqrt{x^2 + 100} + x)$$

$$(6) \lim_{x \to -\infty} x(\sqrt{x^2 + 100} + x)$$

$$(7) \lim_{x \to \infty} \frac{\sqrt{4x^2 + x - 1} + x + 1}{\sqrt{x^2 + \sin x}} \qquad (8) \lim_{x \to 0} \frac{1}{x^3} \left[ \left( \frac{2 + \cos x}{3} \right)^x - 1 \right] \qquad (9) \lim_{x \to 0} \frac{(1 + x)^{\frac{1}{x}} - e}{x} \qquad (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n+1}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n}} \right) = (10) \lim_{n \to \infty} n^2 \left( 2^{\frac{1}{n}} - 2^{\frac{1}{n}} \right) = (10) \lim_{n \to \infty} n^2$$

$$(8)\lim_{x\to 0} \frac{1}{x^3} \left[ \left( \frac{2 + \cos x}{3} \right)^x - 1 \right]$$

$$(9) \lim_{x \to 0} \frac{(1+x)^{\frac{1}{x}} - \epsilon}{x}$$

$$(10)\lim_{n\to\infty} n^2 (2^{\frac{1}{n}} - 2^{\frac{1}{n+1}})$$

$$(11)\lim_{n\to\infty}\left(\frac{1}{n^2+n+1}+\frac{2}{n^2+n+2}+\cdots+\frac{n}{n^2+n+n}\right)$$

$$(12)\lim_{x\to 0} \frac{\sqrt{1+xarctan3x}-1}{sin(1-cosx)}$$

$$(12) \lim_{x \to 0} \frac{\sqrt{1 + xarctan3x} - 1}{sin(1 - cosx)}$$
 
$$(13) \lim_{x \to 0} \frac{sin[sin(sinx)]}{\sqrt{1 + x\sqrt{1 + x}} - 1}$$
 
$$(14) \lim_{x \to +\infty} (sin\frac{1}{x} + cos\frac{1}{x})^x$$

$$(14)\lim_{x\to+\infty} (\sin\frac{1}{x} + \cos\frac{1}{x})^x$$

$$(15) \lim_{x \to 0} \frac{\cos x - e^{-\frac{x}{2}}}{x^2 \sin x \ln(1 + 2x)}$$

$$(16) \lim_{x \to \infty} (\sqrt[3]{x^3 + 3x^2} - \sqrt[4]{x^4 - 2x^3})$$

$$(15)\lim_{x\to 0} \frac{\cos x - e^{-\frac{x}{2}}}{x^2 \sin x \ln(1+2x)} \qquad (16)\lim_{x\to \infty} (\sqrt[3]{x^3 + 3x^2} - \sqrt[4]{x^4 - 2x^3}) \qquad (17)\lim_{n\to \infty} [(n^3 - n^2 + \frac{n}{2})e^{\frac{1}{n}} - \sqrt{1+n^6}]$$

$$(18)\lim_{x\to\frac{\pi}{3}}\frac{tan^3x - 3tanx}{cos(x+\frac{\pi}{6})} \qquad (19)\lim_{x\to+\infty}\frac{ln(1+\frac{1}{x})}{arccosx} \qquad (20)\lim_{n\to\infty}sin(\sqrt{n^2+1}\pi)$$

$$(19)\lim_{x\to+\infty}\frac{ln(1+\frac{1}{x})}{arccosx}$$

$$(20) \lim_{n \to \infty} \sin(\sqrt{n^2 + 1}\pi)$$

$$(21)\lim_{n\to\infty}n^2[\arctan\frac{1}{n}-\arctan\frac{1}{n+1}]$$

$$(21) \lim_{n \to \infty} n^2 \left[\arctan\frac{1}{n} - \arctan\frac{1}{n+1}\right] \qquad \qquad (22) \lim_{x \to 0} \frac{(1+\tan x)^{\frac{1}{tanx}} - (1+\sin x)^{\frac{1}{sinx}}}{tanx - sinx}$$

## 2 积分篇

$$(1) \int \frac{lntanx}{cosxsinx} dx$$

$$(2)\int sin5xsin7xdx$$

$$(1) \int \frac{lntanx}{cosxsinx} dx \qquad (2) \int sin5xsin7x dx \qquad (3) \int \frac{dx}{(x+1)(x-2)} \qquad (4) \int \frac{x^2 dx}{\sqrt{a^2 - x^2}}$$

$$(4)\int \frac{x^2dx}{\sqrt{a^2-x^2}}$$

$$(5) \int \frac{dx}{x\sqrt{x^2 - 1}}$$

$$(6) \int \frac{\sqrt{x^2 - 9}}{x} dx$$

$$(7)\int \frac{dx}{1+\sqrt{1-x^2}}$$

$$(5) \int \frac{dx}{x\sqrt{x^2 - 1}} \qquad (6) \int \frac{\sqrt{x^2 - 9}}{x} dx \qquad (7) \int \frac{dx}{1 + \sqrt{1 - x^2}} \qquad (8) \int \frac{dx}{x + \sqrt{1 - x^2}}$$

$$(9) \int \frac{x-1}{x^2+2x+3} dx \qquad (10) \int \frac{x^3+1}{(x^2+1)^2} dx \qquad (11) \int x^2 \cos^2 \frac{x}{2} dx \qquad (12) \int x \ln(x-1) dx$$

$$(10) \int \frac{x^3 + 1}{(x^2 + 1)^2} dx$$

$$(11) \int x^2 \cos^2 \frac{x}{2} dx$$

$$(12)\int xln(x-1)dx$$

$$(13) \int \frac{ln^3x}{x^2} dx$$

$$(14) \int coslnx dx$$

$$(13) \int \frac{\ln^3 x}{x^2} dx \qquad (14) \int coslnx dx \qquad (15) \int (arcsinx)^2 dx \qquad (16) \int e^x sin^2 x dx$$

$$(16)\int e^x sin^2x dx$$

$$(17) \int \frac{1 + sinx}{sinx(1 + cosx)} dx$$

$$(18) \int \frac{-x^2 - 2}{(x^2 + x + 1)^2} dx$$

$$(19)\int \frac{dx}{2+sinx}$$

$$(17) \int \frac{1 + sinx}{sinx(1 + cosx)} dx \qquad (18) \int \frac{-x^2 - 2}{(x^2 + x + 1)^2} dx \qquad (19) \int \frac{dx}{2 + sinx} \qquad (20) \int \frac{dx}{2 sinx - cosx + 5}$$

$$(21) \int \frac{\sqrt{x+1} - 1}{\sqrt{x+1} + 1} dx$$

$$(21) \int \frac{\sqrt{x+1}-1}{\sqrt{x+1}+1} dx \qquad (22) \int \frac{dx}{\sqrt[3]{(x+1)^2(x-1)^4}} \qquad (23) \int \frac{dx}{\sqrt{x(1+x)}} \qquad (24) \int \frac{x^3 arccosx}{\sqrt{1-x^2}} dx$$

$$(23) \int \frac{dx}{\sqrt{x(1+x)}}$$

$$(24) \int \frac{x^3 arccosx}{\sqrt{1-x^2}} dx$$

$$(25) \int \frac{sinxcosx}{sinx + cosx} dx$$

$$(25) \int \frac{\sin x \cos x}{\sin x + \cos x} dx \qquad (26) \int \frac{dx}{\sin 2x + 2\sin x} dx \qquad (27) \int e^{2x} (\tan x + 1)^2 dx$$

$$(27) \int e^{2x} (tanx + 1)^2 dx$$

$$(28) \int \frac{arctan\sqrt{x} + lnx}{\sqrt{x}} dx$$

$$(29) \int \frac{2x^4 - x^3 - x + 1}{x^3 - 1} dx \qquad (30) \int \frac{\sin x}{\sin x + \cos x} dx$$

$$(30) \int \frac{\sin x}{\sin x + \cos x} dx$$