

$$\textcircled{1} \sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots \infty \quad \textcircled{2} \cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots \infty$$

$$\textcircled{3} \tan x = x + \frac{x^3}{3} + \frac{2}{15}x^5 + \frac{17}{315}x^7 + \dots \infty \quad \textcircled{4} a^x = 1 + \frac{x}{1!}(\ln a) + \frac{x^2}{2!}(\ln a)^2 + \frac{x^3}{3!}(\ln a)^3 + \dots \infty$$

$$\textcircled{5} e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots \infty$$

$$\textcircled{6} \ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots + \infty$$

$$\textcircled{7} \ln(1-x) = -x - \frac{x^2}{2} - \frac{x^3}{3} - \dots \infty$$

$$\textcircled{8} \sin(A+B) = \sin A \cdot \cos B + \cos A \cdot \sin B$$

$$\textcircled{9} \sin(A-B) = \sin A \cdot \cos B - \cos A \cdot \sin B$$

$$\textcircled{10} \cos(A+B) = \cos A \cdot \cos B - \sin A \cdot \sin B$$

$$\textcircled{11} \cos(A-B) = \cos A \cdot \cos B + \sin A \cdot \sin B$$

$$\textcircled{12} \tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \cdot \tan B}$$

$$\textcircled{13} \tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \cdot \tan B}$$

$$\textcircled{14} \sin 2A = 2 \sin A \cdot \cos A$$

$$\textcircled{15} \sin 2A = \frac{2 \tan A}{1 + \tan^2 A}$$

$$\textcircled{16} \cos 2A = \cos^2 A - \sin^2 A$$

$$\textcircled{17} \cos 2A = 2 \cos^2 A - 1$$

$$\textcircled{18} 2 \cos^2 A = 1 + \cos 2A$$

$$\textcircled{19} \cos 2A = 1 - 2 \sin^2 A$$

$$(20) \quad 2\sin A = 1 - \cos 2A$$

$$(21) \quad \cos 2A = \frac{1 - \tan^2 A}{1 + \tan^2 A}$$

$$(22) \quad \sin(A+B) + \sin(A-B) = 2\sin A \cos B$$

$$(23) \quad \sin(A+B) - \sin(A-B) = 2\cos A \sin B$$

$$(24) \quad \cos(A+B) + \cos(A-B) = 2\cos A \cos B$$

$$(25) \quad \cos(A+B) - \cos(A-B) = -2\sin A \sin B$$

$$(26) \quad \sin C + \sin D = 2\sin \frac{C+D}{2} \cos \frac{C-D}{2}$$

$$(27) \quad \sin C - \sin D = 2\cos \frac{C+D}{2} \sin \frac{C-D}{2}$$

$$(28) \quad \cos C + \cos D = 2\cos \frac{C+D}{2} \cos \frac{C-D}{2}$$

$$(29) \quad \cos C - \cos D = -2\sin \frac{C+D}{2} \sin \frac{C-D}{2}$$

$$(30) \quad \lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = n a^{n-1} \quad (31) \quad \lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$(32) \quad \lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

$$(33) \quad \lim_{x \rightarrow 0} \frac{\cos ax - \cos bx}{x^2} = \frac{b^2 - a^2}{2}$$

$$(34) \quad \lim_{x \rightarrow 0} \frac{\ln(1+x)}{x} = 1$$

$$(35) \quad \lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$

$$(36) \quad \lim_{x \rightarrow 0} (1+x)^{1/x} = e$$

$$(37) \quad \lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$(38) \quad \lim_{x \rightarrow 0} (1+ax)^{\frac{bx+c}{dx}} = e^{\frac{ac}{d}}$$

$$(39) \quad \lim_{x \rightarrow 1} (1+3x)^{\frac{7x+1}{2x}} = e^{\frac{10}{3}} = e^{3\frac{1}{3}}$$

$$(40) \quad \lim_{x \rightarrow \infty} \left(\frac{x+a}{x+b}\right)^x = e^{a-b}$$

$$(41) \quad \lim_{x \rightarrow \infty} \left(\frac{x+3}{x+4}\right)^x = e^{-1} = e^{-1}$$