$\exp z = e^z = e^x(\cos y + i\sin y), z = x+iy;$

e^z
$e^{z_1}\cdot$
$e^{z_2} =$
$e^{z_1+z_2}$
$e^{z+2\pi i} =$
e^z
z
$e^{z+w} =$
e^z
$w = 2\pi ki\,(k = 0, \pm1, \pm2, \ldots).$

$\exp i\phi =$
$e^{i\phi} =$
$\cos\phi +$
$i\sin\phi$
$z =$
$re^{i\phi}$
$z =$
$r(\cos\phi + i\sin\phi)$
ϕ
$-\pi <$
$\phi \le$
π
$1, -1, i, -i, 1+i, 1-i, -1+i, -1-i.$

$e^{\pm\frac{\pi}{2}i}, e^{k\pi i}\,(k = 0, \pm1, \pm2, \ldots).$

$e^{2+i}, e^{2-3i}, e^{3+4i}, e^{-3-4i}, -ae^{i\phi}\,(a > 0, |\phi| \le \pi), e^{-i\phi}\,(|\phi| \le \pi).$

$\log z =$
$\ln r +$
$i\phi +$
$2k\pi i\,(k = 0, \pm1, \pm2, \ldots), z =$
$re^{i\phi},$
$\mathrm{Log} z =$
$\ln r +$
$i\phi\,(-\pi < \phi \le \pi)$
$\mathrm{Log} z$
z
$4, \log(-1), \mathrm{Log}(-1);$
$\log i, \mathrm{Log} i;$
$\log 1 \pm i\sqrt{2};$
$\log(2-$
$3i), \log(-2+$
$3i).$
:
$(-z)^2 =$
z^2
$2\log(-z) =$
$2\log z$
$\log(-z) = \log z.$

$f(z)$
$z =$
2
z
$z =$
0
$z =$
2
$f(z)$
z
$f(z)$
$f(z) =$
$2\log z$
$f(z) =$
$\log 1z$
$f(z) =$
$\log z -$
$\log(z+$
$1)$
$f(z) =$
$\log z +$
$\log(z+$
$1)$
$a \ne$
0
α
$a^\alpha = \exp\{\alpha\log a\}$

*
(1)

$\exp z$
e^z
$a^\alpha = e^{\alpha\log a}$

$(*)$
$e^z =$
$\exp\{z\log e\} =$
$\exp\{z(1+$