→   /· Complex Analysis
       1. computation of complex numbers
       2. residue · /

(%i8) /· 1-1. computation of complex numbers · /
       /· putting · /
       α:4+7 · %i;
       /· sqrt of a negative number · /
       sqrt(−3);
       /· addition · /
       (1+2 · %i)+(4+3 · %i);
       /· a+b · %i · /
       rectform((1+2 · %i) · (4+3 · %i));
       rectform((1+2 · %i)/(3−4 · %i));
       /· real and imaginary parts · /
       realpart(3+4 · %i);
       imagpart(3+4 · %i);
       /· complex conjugate · /
       conjugate(1/5+2/3 · %i);

(α) $7\,\%i + 4$

(%o2) $\sqrt{3}\,\%i$

(%o3) $5\,\%i + 5$

(%o4) $11\,\%i - 2$

(%o5) $\dfrac{2\,\%i}{5} - \dfrac{1}{5}$

(%o6) 3

(%o7) 4

(%o8) $\dfrac{1}{5} - \dfrac{2\,\%i}{3}$

(%i14) /* 1-2. computation of complex numbers */
       /* absolute value */
       abs(1/5+2/3 · %i);
       /* argument */
       carg(1/2+sqrt(3)/2 · %i);
       /* polar form */
       polarform(1+sqrt(3) · %i);
       /* the principal value of the logarythm */
       plog(1+sqrt(3) · %i);
       /* principal value */
       rectform(%i^%i);
       rectform(%i^(1/%i));

(%o9) $\dfrac{\sqrt{109}}{15}$

(%o10) $\dfrac{\pi}{3}$

(%o11) $2\,\%e^{\frac{\%i\,\pi}{3}}$

(%o12) $\log\left(2\right)+\dfrac{\%i\,\pi}{3}$

(%o13) $\%e^{-\frac{\pi}{2}}$

(%o14) $\%e^{\pi/2}$

(%i23) /* 2. residue */
```
residue( z/( z^2 - A^2 ), z, A );
residue( z/( z^2 - A^2 ), z, -A );
residue(1/(z·(z^2-1)),z,0);
residue(1/(z·(z^2-1)),z,1);
residue(1/(z·(z^2-1)),z,-1);
residue(1/(1+z^4),z,exp(%pi·%i/4));
residue(1/(1+z^4),z,exp(3·%pi·%i/4));
residue(1/(1+z^4),z,exp(5·%pi·%i/4));
residue(1/(1+z^4),z,exp(7·%pi·%i/4));
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(%o15) $\dfrac{1}{2}$

(%o16) $\dfrac{1}{2}$

(%o17) -1

(%o18) $\dfrac{1}{2}$

(%o19) $\dfrac{1}{2}$

(%o20) $-\dfrac{\%i+1}{2^{5/2}}$

(%o21) $-\dfrac{\%i-1}{2^{5/2}}$

(%o22) $\dfrac{\%i+1}{2^{5/2}}$

(%o23) $\dfrac{\%i-1}{2^{5/2}}$