Complex Numbers

(%i1) z = x + y%i ;

(%o1) $z = y\%i + x$

(%i2) z2 = r · cos (Θ) + r · sin (Θ) · %i ;

(%o2) $z2 = \%i r \sin(\Theta) + r \cos(\Theta)$

(%i3) z3 = r · %e ^ (%i · Θ) ;

(%o3) $z3 = r\,\%e^{\%i\Theta}$

(%i4) z1 : x1 + y1 · %i ;

(%o4) $\%i y1 + x1$

(%i5) z2 : x2 + y2 · %i ;

(%o5) $\%i y2 + x2$

(%i6) z1 + z2 ;

(%o6) $\%i y2 + \%i y1 + x2 + x1$

(%i7) rectform (%) ;

(%o7) $\%i\,(y2 + y1) + x2 + x1$

(%i8) rectform (z1 · z2) ;

(%o8) $\%i\,(x1\,y2 + x2\,y1) - y1\,y2 + x1\,x2$

(%i9) rectform (z1 / z2) ;

(%o9) $\dfrac{y1\,y2 + x1\,x2}{y2^2 + x2^2} + \dfrac{\%i\,(x2\,y1 - x1\,y2)}{y2^2 + x2^2}$

(%i10) rectform (z1 ^ 2) ;

(%o10) $-y1^2 + 2\%i x1\,y1 + x1^2$

(%i11) rectform ((2 · %i) · (2 + 3 · %i)) ;

(%o11) $4\%i - 6$

(%i12) rectform ((4 + 5 · %i) / (− 2 + 7 · %i)) ;

(%o12) $\dfrac{27}{53} - \dfrac{38\%i}{53}$

(%i13) rectform ((3 + 5 · %i) ^ 2) ;

(%o13) $30\%i - 16$

(%i15) z1 : r1%e ^ (%i · Θ1) ; z2 : r2 · %e ^ (%i · Θ2) ;

(%o14) $r1\,\%e^{\%i\Theta1}$

(%o15) $r2\,\%e^{\%i\Theta2}$

(%i16) polarform (z1 + z2) ;

(%o16) $\sqrt{\left(r2\sin(\Theta2) + \%e^{-\operatorname{atan2}(0\,,\,r1\%e)\Theta1}\sin(\log(|r1\%e|)\Theta1)\right)^2 + \left(r2\cos(\Theta2) + \%e^{-\operatorname{atan2}(0\,,\,r1\%e)\Theta1}\cos(\log(|r1\%e|)\Theta1)\right)^2}\;\%e^{\%i\operatorname{atan2}\left(r2\sin(\Theta2)+\%e^{-\operatorname{atan2}(0\,,\,r1\%e)\Theta1}\sin(\log$

(%i17) polarform (z1 · z2) ;

(%o17) $|r2|\;\%e^{\%i(\operatorname{atan2}(\sin(\Theta2)\,,\cos(\Theta2))+\operatorname{atan2}(\sin(\log(|r1\%e|)\Theta1)\,,\cos(\log(|r1\%e|)\Theta1))+\operatorname{atan2}(0\,,\,r2))-\operatorname{atan2}(0\,,\,r1\%e)\Theta1}$

(%i18) polarform ((2 − 2 · %i) · (5 − 7 · %i)) ;

(%o18) $2^{\frac{3}{2}}\sqrt{74}\,\%e^{\%i\left(-\operatorname{atan}\left(\frac{7}{5}\right)-\frac{\pi}{4}\right)}$

(%i19) polarform (5 + 3 · %i) ;

(%o19) $\sqrt{34}\,\%e^{\%i\operatorname{atan}\left(\frac{3}{5}\right)}$

(%i20) polarform (3 + 3 · %i) ;

(%o20) $3\sqrt{2}\,\%e^{\frac{\%i\pi}{4}}$

(%i21) realpart (x + %i · y) ;

(%o21) x

(%i22) realpart (5 + 7 · %i) ;

(%o22) 5

(%i23) imagpart (5 + 7 · %i) ;

(%o23) 7

(%i24) imagpart ((2 + 3 · %i) / (1 + 4 · %i)) ;

(%o24) $-\frac{5}{17}$

(%i25) realpart ((2 + 3 · %i) / (1 + 4 · %i)) ;

(%o25) $\frac{14}{17}$

(%i26) realpart ((2 + 3 · %i) / (1 + 4 · %i)) ;

(%o26) $\frac{14}{17}$

(%i27) demoivre (%e ^ (%i · Θ)) ;

(%o27) $\%i\sin\left(\Theta\right)+\cos\left(\Theta\right)$
