1 Kolobarji polinomov

1.1 Računanje s kompleksnimi števili

$$z = x + iy = re^{i\varphi} = r\left(\cos\varphi + i\sin\varphi\right)$$

$$r = |z| = \sqrt{x^2 + y^2} \qquad\qquad \varphi = \arg z = \arctan\frac{y}{x}$$

De Moivreova formula

$$z^n = r^n\left(\cos\varphi n + i\sin\varphi n\right)$$

Osnovni izrek algebre

Vsak nekonstanten polinom $a_n x^n + \cdots + a_0$ ima natanko n kompleksnih ničel (štetih z večkratnostjo).

Trigonometrične identitete

$$\begin{aligned}
\sin(x \pm y) &= \sin(x)\cos(y) \pm \cos(x)\sin(y)\\
\cos(x \pm y) &= \cos(x)\cos(y) \mp \sin(x)\sin(y)\\
\tan(x \pm y) &= \frac{\tan(x) \pm \tan(y)}{1 \mp \tan(x)\tan(y)}\\
\cot(x \pm y) &= \frac{\cot(x)\cot(y) \mp 1}{\tan(x) \pm \tan(y)}\\
\sin^2(x) + \cos^2(x) &= 1\\
1 + \cot^2(x) &= \frac{1}{\sin^2(x)}\\
1 + \tan^2(x) &= \frac{1}{\cos^2(x)}\\
\sin\frac{x}{2} &= \pm\sqrt{\frac{1 - \cos x}{2}}\\
\cos\frac{x}{2} &= \pm\sqrt{\frac{1 + \cos x}{2}}
\end{aligned}$$

Mali Fermantov izrek

$$\forall a \in \mathbb{Z}, p \in \mathbb{P}:\ \ a^p \equiv_p a \tag{1}$$