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Numere complexe

$$i^2 = -1 \qquad i^{4k} = 1$$

$$z = a + bi = r(\cos t + i \sin t)$$

$$r = \sqrt{a^2 + b^2}$$

$$t = arctg\ \frac{a}{b} + k\pi$$

$$t \in C_1 \Rightarrow k = 0 \qquad t \in C_2; C_3 \Rightarrow k = 1$$

$$t \in C_4 \Rightarrow k = 2$$

$$z^n = r^n(\cos nt + i \sin nt)$$

$$\sqrt[n]{z} = \sqrt[n]{r}\left(\cos\frac{t+2k\pi}{n} + i\sin\frac{t+2k\pi}{n}\right)$$

$$\frac{D}{Î} = C + \frac{R}{Î}$$

Teorema împărţirii cu rest

Sume

$$S_1 = 1+2+3+\ldots\ldots\ldots\ldots+n = \frac{n(n+1)}{2}$$

$$S_2 = 1^2+2^2+3^2+\ldots\ldots\ldots+n^2 = \frac{n(n+1)\bullet(2n+1)}{6}$$

$$S_3 = 1^3+2^3+3^3+\ldots\ldots\ldots\ldots+n^3 = \frac{[n(n+1)]^2}{4}$$

Relaţiile lui Viėte

$$ax^3+bx^2+cx+d$$

$$S_1 = x_1 + x_2 + x_3 = \frac{-b}{a}$$

$$S_2 = x_1x_2 + x_1x_3 + x_2x_3 = \frac{c}{a}$$

$$S_3 = x_1x_2x_3 = \frac{-d}{a}$$

$$ax^4 + bx^3 + cx^2 + dx + e$$

$$S_1 = x_1 + x_2 + x_3 + x_4 = \frac{-b}{a}$$

$$S_2 = (x_1 + x_2) \bullet (x_3 + x_4) + x_1x_2 + x_3x_4 = \frac{c}{a}$$

$$S_3 = x_1x_2(x_3 + x_4) + x_3x_4(x_1 + x_2) = \frac{-d}{a}$$

$$S_4 = x_1 \cdot x_2 \cdot x_3 \cdot x_4 = \frac{e}{a}$$

Ecuaţii reciproce

1. de gradul III

$$ax^3 + bx^2 + bx + a = 0$$

2. de gradul IV

$$ax^4 + bx^3 + cx^2 + bx + a = 0 \,/ : x^2$$

$$ax^2 + bx + c + \frac{b}{x} + \frac{a}{x^2} = 0$$

$$a(x^2 + \frac{1}{x^2}) + b(x + \frac{1}{x}) + c = 0$$

- se notează

$$x + \frac{1}{x} = y \Rightarrow x^2 + \frac{1}{x^2} = y^2 - 2$$

Ec.binoame şi bipătrate:

$$x^n - a = 0$$

$$ax^{2n} + bx^n + c = 0, x^n = y \Rightarrow$$

$$ay^2 + by + c = 0$$