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Ex:1 Rezolvaţi ecuaţia $2x^5+3x^4+2x^3+2x^2+3x+2=0$ ştiind că $x_1=\frac{1+i\sqrt{3}}{2}$

$$x_1=\frac{1+i\sqrt{3}}{2}$$

$$\Downarrow$$

$$x_2=\frac{1-i\sqrt{3}}{2}$$

Polinomul este divizibil cu:

$$(x-\frac{1+i\sqrt{3}}{2})(x-\frac{1-i\sqrt{3}}{2})=(x-\frac{1}{2}+\frac{i\sqrt{3}}{2})(x-\frac{1}{2}-\frac{i\sqrt{3}}{2})=$$

$$=(x-\frac{1}{2})-(\frac{i\sqrt{3}}{2})^2=x^2-x+\frac{1}{4}+\frac{3}{4}=x^2-x+1$$

$$\begin{array}{l|l}
2x^5+3x^4+2x^3+2x^2+3x+2 & x^2-x+1 \\
\hline
-2x^5+2x^4-2x^3 & 2x^3+5x^2+5x+2 \\
\quad 5x^4+2x^2 & \\
\quad -5x^4+5x^3-5x^2 & \\
\qquad 5x^3-3x^2+3x & \\
\qquad -5x^3+5x^2-5x & \\
\qquad\quad 2x^2-2x+2 & \\
\qquad\quad -2x^2+2x-2 & \\
\qquad\quad = \quad = \quad = &
\end{array}$$

Ecuaţii de grad superior

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$$(2x^3+5x^2+5x+2)(x^2-x+1)=0$$

$$2x^3+5x^2+5x+2=0$$

$$2(x^3+1)+5x(x+1)=0$$

$$2(x+1)(x^2-x+1)+5x(x+1)=0$$

$$(x+1)[2(x^2-x+1)+5x]=0$$

$$(x+1)(2x^2-2x+2+5x)=0$$

$$(x+1)(2x^2+3x+2)=0$$

$$x_3=-1$$

$$x_{4,5}=\frac{-3\pm i\sqrt{7}}{4}$$

$$x^2-x+1=0$$

$$x_{1,2}=\frac{1\pm i\sqrt{3}}{2}$$