

1. Aflati ultimele 2 cifre ale lui 32^{30} .

$$32^{30} = 32^2 = 1024 = 24 \Rightarrow 24 = 13824 = 24 = 8^{15} \cdot 3^5 = 24$$

2. Det restul imp lui 38^{131} .

a) la 3

b) la 9

a) $38^{131} \equiv ? \pmod{3}$

$$38 = 2 \cdot 19 \Rightarrow 38^{131} = 2^{131} \cdot 19^{131} = 2^{130} \cdot 2 \cdot 19^{131} = (2^2)^{65} \cdot 2 \cdot 19^{131}$$

$$38^{131} \equiv 4^{65} \cdot 2 \cdot 19^{131} \equiv 1^{65} \cdot 2 \cdot 1^{131} \equiv 2 \pmod{3}$$

3. Det catul si restul imp lui f la g:

$$f = x^4 + 5x^2 + x - 1 \in \mathbb{R}[x]$$

$$g = 3x + 2$$

$$\begin{array}{r|l} x^4 + 5x^2 + x - 1 & 3x + 2 \\ -x^4 - \frac{2}{3}x^3 & \frac{4}{3}x^3 - \frac{2}{3}x^2 + \frac{49}{27}x - \frac{31}{81} \\ \hline -\frac{2}{3}x^3 + 5x^2 + x - 1 & \\ -\frac{2}{3}x^3 + \frac{4}{9}x^2 & \\ \hline \frac{49}{9}x^2 + x - 1 & \\ -\frac{49}{9}x^2 - \frac{38}{27}x & \\ \hline -\frac{71}{27}x - 1 & \end{array}$$