

$$1) P(x) = x^4 - 20x^2 + 64 \quad \text{NS}(-2/0)$$

x	-3	-2	-1	0	1	2	3
P(x)	0	45	64				
	✓	✗	✗				

$$\begin{array}{r} (x^4 + 0x^3 - 20x^2 + 0x + 64) : (x+2) = \underline{x^3 - 2x^2 - 16x + 32} \\ -(x^4 + 2x^3) \\ \hline 0 - 2x^3 - 20x^2 \\ -(-2x^3 - 4x^2) \\ \hline 0 - 16x^2 + 0x \\ -(-16x^2 - 32x) \\ \hline 0 + 32x + 64 \\ -(+32x + 64) \\ \hline 0 \end{array}$$

$$P(x) = (x+2) \cdot (x^3 - 2x^2 - 16x + 32)$$

$$\Rightarrow \underbrace{(x+2)}_{F_1} \cdot \underbrace{(x^3 - 2x^2 - 16x + 32)}_{F_2} = 0$$

$$F_1 = 0 \Rightarrow x+2 = 0$$

$$\underline{x = -2}$$

$$F_2 = 0 \Rightarrow (x^3 - 2x^2 - 16x + 32) = 0 \quad \text{NS}(2/0)$$

x	-3	-2	-1	0	1	2	3
P(x)			32	15	0		
			✗	✗	✓		

$$\begin{array}{r} (x^3 - 2x^2 - 16x + 32) : (x-2) = x^2 - 16 \\ -(x^3 - 2x^2) \\ \hline 0 + 0 - 16x + 32 \\ -(-16x + 32) \\ \hline 0 - 32 + 32 \\ \hline 0 \end{array}$$

$$P(x) = \underbrace{(x+2)}_{F_1} \cdot \underbrace{(x-2)}_{F_2} \cdot \underbrace{(x^2-16)}_{F_3}$$

$$\Rightarrow \underbrace{(x+2)}_{F_1} \cdot \underbrace{(x-2)}_{F_2} \cdot \underbrace{(x^2-16)}_{F_3} = 0$$

$$F_1 = 0 \Rightarrow x+2 = 0 \quad F_2 = 0 \Rightarrow x-2 = 0 \quad F_3 = 0 \Rightarrow x^2 - 16 = 0$$

$$\underline{x = -2}$$

$$\underline{x = +2}$$

$$x^2 = 16$$

$$|x| = 4$$

$$\text{Fall 1: } \underline{x = 4} \quad \text{Fall 2: } -(x) = 4$$

$$\underline{x = -4}$$

$$P(x) = (x+2) \cdot (x-2) \cdot (x-4) \cdot (x+4)$$