№1

а)

$L_0(x) = \frac{x}{-1} \cdot \frac{x-1}{-2} \cdot \frac{x-3}{-1-3} = -\frac{x^3-4x^2+3x}{8}$

$L_1(x) = \frac{x+1}{0+1} \cdot \frac{x}{0-1} \cdot \frac{x-3}{0-3} = \frac{x^3-3x^2-1x+3}{3}$

$y_0 L_0(x) = \frac{x^3-4x^2+3x}{4}$

$y_1 L_1(x) = \frac{4x^3-12x^2-4x+12}{3}$

$L_2(x) = \frac{x+1}{1-(-1)} \cdot \frac{x}{1-0} \cdot \frac{x-3}{1-3} = -\frac{x^3-2x^2-3x}{4}$

$L_3(x) = \frac{x+1}{3+1} \cdot \frac{x}{3} \cdot \frac{x-1}{3-1} = \frac{x^3-x}{24}$

$y_2 L_2(x) = -\frac{3x^3-6x^2-9x}{2}$

$y_3 L_3(x) = \frac{11x^3-11x}{12}$

$p(x) = \frac{3x^3-12x^2+9x}{12} + \frac{16x^3-48x^2-16x+48}{12} - \frac{18x^3-36x^2-54x}{12} + \frac{11x^3-11x}{12}$

$= \frac{13x^3-60x^2-7x+48}{12} + \frac{-7x^3+36x^2+43x}{12}$

$= \frac{12x^3-24x^2+36x+48}{12}$

$= x^3-2x^2+3x+4$

б)

x_i	y_i			
-1	-2 = a_0			
0	4	$\frac{4-(-2)}{0-(-1)} = 6 = a_1$		
1	6	$\frac{6-4}{1-0} = 2$	$\frac{2-6}{1-(-1)} = -2 = a_2$	
3	22	$\frac{22-6}{3-1} = 8$	$\frac{8-2}{3-0} = 2$	$\frac{2-(-2)}{3-(-1)} = 1 = a_3$

$p(x) = -2 + 6(x+1) - 2(x+1)(x) + 1(x+1)(x)(x-1)$

$= -2 + 6x + 6 - 2x^2 - 2x + x^3 - x$

$= x^3 - 2x^2 + 3x + 4$