Homework 13

1-) P_0, P_1, P_2, P_3

$x^3 + x^2 + x + 1 \rightarrow P^3$

$(1, x, x^2, x^3) \rightarrow$ Replace x^2 with anything that still maintains the linear independence. It should not be a multiple of existing elements

Try:

$x^3 + 1$

$(1, x, x^3, x^3 + 1)$

Linear independence

$a(1) + b(x) + c(x^3) + d(x^3 + 1) = 0$

$a + bx + cx^3 + dx^3 + d = 0$

$a + d + bx + (c + d)x^3 = 0$

$a + d = 0 \rightarrow d = -a$

$b = 0$

$c + d = 0 \rightarrow c = -d$

$a = 0, b = 0, c = 0, d = 0$ Linearly independent