ex:) 已知 3次多项式 $f(x)$ 满足 $f(-1)=11$, $f(2)=-16$, $f(3)=3$, $f(4)=66$,

求 $f(x)$

$f(x) = a(x+1)(x-2)(x-3) + b(x+1)(x-2) + c(x+1) + d$

$f(-1) = d = 11$

$f(2) = 3c + d = -16 \Rightarrow c = -9$

$f(3) = 4b + 4c + d = 3 \Rightarrow b = 7$

$f(4) = 10a + 10b + 5c + d = 66 \Rightarrow a = 3$

$\Rightarrow f(x) = 3(x+1)(x-2)(x-3) + 7(x+1)(x-2) - 9(x+1) + 11$

$= 3(x^3 - 4x^2 + x + 6) + 7(x^2 - x - 2) - 9x - 9 + 11$

$= 3x^3 - 12x^2 + 3x + 18 + 7x^2 - 7x - 14 - 9x + 2$

$= 3x^3 - 5x^2 - 13x + 6$ #