Quiz–Taylor Series

Compute the Maclaurin series and Taylor series about $x_0 = 1$ and $x_0 = -1$ of the function $f(x) = 1 + 2x + x^2$. Give your answers as expansions in powers of x, $(x-1)$ and $(x+1)$, respectively; that is, do *not* multiply out the expressions.

Show all work and clearly mark your final answer. No calculators/notes allowed. Partial credit will be given for correctly explaining any steps you're unable to carry out, as well as demonstrating correct methods with computational errors.

The Maclaurin series of $f(x)$ is $1 + 2x + x^2$: as a polynomial, it is already given as an expansion in terms of powers of x. The Taylor series about 1 is $4 + 4(x-1) + (x-1)^2$, and about -1 is $(x+1)^2$.