

(1) [8 points] Use long division to find the quotient and remainder when $5x^4 - 3x^2 + x + 1$ is divided by $x^2 + 2$. Clearly (and neatly) show all steps.

(2) [4 points] Use synthetic division to find the quotient and remainder when $x^5 - 4x^3 + x$ is divided by $x + 3$.

(3) [3 points] Use synthetic division to determine if $x - 2$ is a factor of $3x^4 - 6x^3 - 5x + 10$.