

Supplementary Problems on Mathematical Induction

1. (i) Prove for all the natural numbers n that $6 \mid (2n^3 + 3n^2 + n)$
(ii) Prove $12 \mid (n^4 - n^2)$ for any natural number n .
2. Prove Fermat's Little Theorem:
Let $n \in \mathbb{N}$ and p be any prime. Then $p \mid n^p - n$.