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Question: Evaluate $f'(1102)$ where $f(x) = (x-1)(x-2)(x-3)(x-2012)(x-2013)$.

Solution: $f'(x) = \sum_{i=1}^{2013} \prod_{j=1, j\neq i}^{2013} (x-j)$

$f'(x)$ consists of sum of 2013 terms, among these , excet 1102nd term, all the terms are consist of the factor $(x-1102)$.

Hence $f'(1102) = \prod_{j=1, j\neq 1102}^{2013} (1102-j)$, since all other terms are zero.

$f'(1102) = \left(\prod_{j=1}^{1101} j\right) * \left(\prod_{k=1}^{911} (-k)\right) = 1101! * (-1)^{911} * 911! = -1101! * 911!$