Let $(a_n)_{n\in\mathbb{N}}$ be a sequence of integers

Let $p = \max(\{a_i \cdot a_j \cdot a_k \mid a_i, a_j, a_k \in (a_n) ; i<j<k\})$

Let $a_{f_1}, a_{f_2}, a_{f_3}$ be the three largest integers s.t
(*) $a_{f_1} \leq a_{f_2} \leq a_{f_3}$

if $0 \leq a_{f_1}$ then the only option for p is
$\{a_{f_1}, a_{f_2}, a_{f_3}\}$ or $\{a_{s_1}, a_{s_2}, a_{f_3}\}$ s.t $a_{s_1} \leq a_{s_2}$ (**)
are the two smallest integers in (a_n) and $a_{s_2} < 0$
because if $a_{f_1} \cdot a_{f_2} < a_{s_1} \cdot a_{s_2} = |a_{s_1}| \cdot |a_{s_2}|$ then
$a_{f_1} \cdot a_{f_2} \cdot a_{f_3} < a_{s_1} \cdot a_{s_2} \cdot a_{f_3}$.

if $a_{f_3} \leq 0$ then $p \leq 0$ so the only option for p
see (*)
is $\{a_{f_1}, a_{f_2}, a_{f_3}\}$

if $0 < a_{f_3}$ and ($a_{f_1} \leq 0$ or $a_{f_2} \leq 0$) then,
if $0 < a_{f_2}$ then $\prod_{i=1}^{3} a_{f_i} < 0$.
From (**) we get $0 < a_{s_1} \cdot a_{s_2}$, so $\prod_{i=1}^{3} a_{f_i} < a_{s_1} \cdot a_{s_2} \cdot a_{f_3}$ (Δ)
if $a_{f_2} \leq 0$ then again $0 \leq a_{s_1} \cdot a_{s_2}$ and we get
(Δ)

There're no more options for p, from here we need only to implement the code according to the cases above.