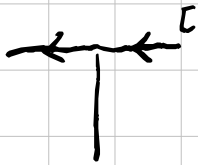
* . forbidden sub-permutations



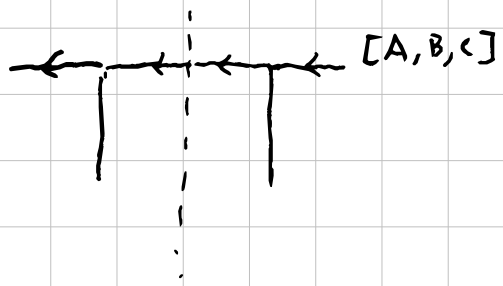
Avoid [C, A, B]

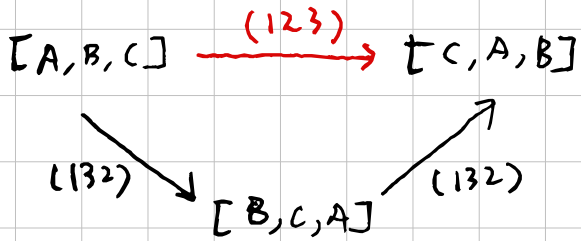
↳ 231 (one-line)

(123) (cycles).

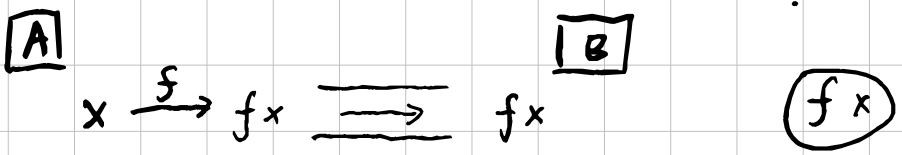
taking $\sqrt{(123)} = (132)$ accepted.

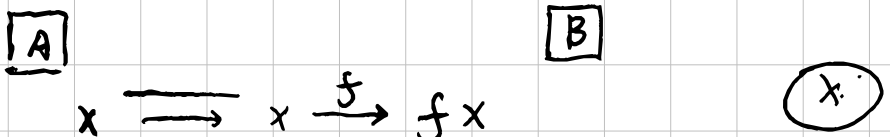
So $\left(\sqrt{(123)} \circ \sqrt{(123)}\right)[A, B, C] = [C, A, B]$

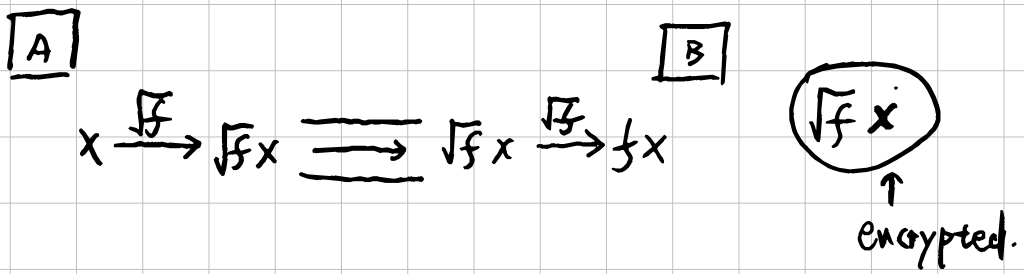




* security channel & signal processing.







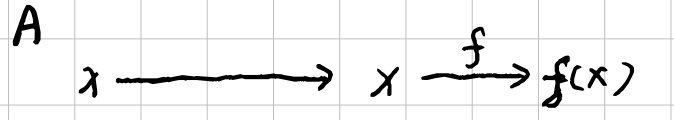
with $(\sqrt{f})^{-1}$ and $\sqrt{f}$, B can get:

- $\sqrt{f} \cdot \sqrt{f}x = fx$ (fully processed data).
- $(\sqrt{f})^{-1} \cdot \sqrt{f}x = x$ (unprocessed data)

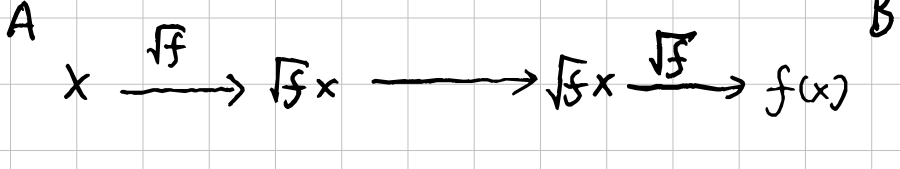
* distribution of "computation labor"

$f(x)$: heavy task.

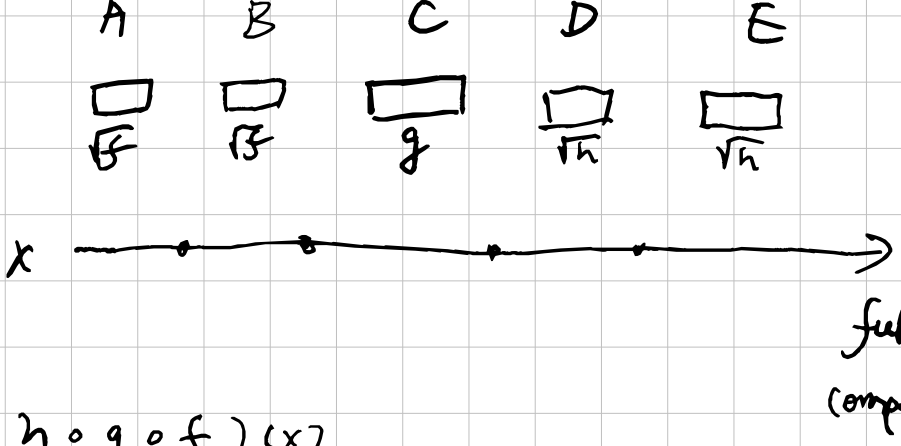
A computes $f(x)$, B just receives result.



A just sends x, B computes $f(x)$.



A computes $v = \sqrt{f}(x)$, B computes $\sqrt{f}(v)$



$(h \circ g \circ f)(x)$.

for A, B, C, D, E.