① (A) $[0,1]$ w/ $\mathcal{T}_{std}$

(B) $[0,1]$ w/ discrete top.

② (C) $[0,1]$ w/ trivial top.

(D) $[3]$ w/ Alexandroff topology

③ (E) $\mathbb{Z}$ w/ finite-complement topology.

(F) $\mathbb{Q}$ w/ subspace topology inherited from $\mathbb{R}$

HIRO

(G) $\{1,2,3,4,5\}$ w/ U open $\Leftrightarrow U = \phi$ OR $1 \in U$

(H) $\{1,2,3\}$ w/ discrete topology.

	A	B	C	D	E	F	G	H
Is diagonal open?	no	yes	no	no	no	no	NO	YES
Is diagonal closed?	yes	yes	no	no	no	yes	NO	YES
Is X Hausdorff?	yes	yes	no	no	no	yes	NO	YES
NOTES								

① If Δ is open, it's closed.
② If X is discrete, all "yes".
③ If X is Hausdorff, diagonal closed.
④ If Δ is closed, Δ is open.
⑤ If Δ is NOT closed, Δ is NOT open.
⑥ If X is not Haus., Δ is neither open nor closed.

Classmates' Conjectures

HIRD

YES

YES

YES

① If Δ is open, it's closed.

② If X is discrete, all "yes".

③ If X is Hausdorff, diagonal closed.

④ If Δ is closed, Δ is open.

⑤ If Δ is NOT closed, Δ is NOT open.

⑥ If X is not Haus., Δ is neither open nor closed.

⑦ If $\exists\ x \in X$ s.t. "U open + $U \neq \emptyset \Rightarrow x \in U$" then "No" anywhere