$$\ker d_1 = A = \frac{\{a \in F^pK^{p+q} : da \in F^{p+2}K^{p+q+1}\} + F^{p+1}K^{p+q}}{d(F^pK^{p+q-1}) + F^{p+1}K^{p+q}} \quad \cdots ①$$

$$\operatorname{im} d_1 = \frac{d(F^{p-1}K^{p+q-1}) \cap F^pK^{p+q} + d(F^pK^{p+q-1}) + F^{p+1}K^{p+q}}{d(F^pK^{p+q-1}) + F^{p+1}K^{p+q}}$$

Since $d(F^pK^{p+q-1}) \subset F^pK^{p+q}$ and $d(F^{p-1}K^{p+q-1}) \supset d(F^pK^{p+q-1})$, $d(F^pK^{p+q-1}) \subset d(F^{p-1}K^{p+q-1}) \cap F^pK^{p+q}$.

$$\Rightarrow \operatorname{im} d_1 = \frac{d(F^{p-1}K^{p+q-1}) \cap F^pK^{p+q} + F^{p+1}K^{p+q}}{d(F^pK^{p+q-1}) + F^{p+1}K^{p+q}} \quad \cdots ②$$

Note that $d(F^{p-1}K^{p+q-1}) \cap F^pK^{p+q} + F^{p+1}K^{p+q}$
$= (d(F^{p-1}K^{p+q-1}) + F^{p+1}K^{p+q}) \cap F^pK^{p+q}$,
for $(V+W) \cap U = V \cap U + W \cap U$, where $W \subset U$.
$(\subset)$ $v + w = u \Rightarrow v = u - w \in U \Rightarrow v \in V \cap U$
$(\supset)$ $V \cap U \subset (V+W) \cap U$ and $W \subset (V+W) \cap U$,
and $V = d(F^{p-1}K^{p+q-1})$. $W = F^{p+1}K^{p+q}$, $U = F^pK^{p+q}$.

$$\Rightarrow \frac{①}{②} = \frac{\ker d_1}{\operatorname{im} d_1} = \frac{\{a \in F^pK^{p+q} : da \in F^{p+2}K^{p+q+1}\} + F^{p+1}K^{p+q}}{(d(F^{p-1}K^{p+q-1}) + F^{p+1}K^{p+q}) \cap F^pK^{p+q}}$$

Notice the following isomorphism.

$$\frac{A}{A \cap C} \xrightarrow{h} \frac{A+B}{C}, \quad a + A\cap C \longmapsto a + C \qquad \text{where } C \supset B.$$

Clearly $h$ is well-defil. $h([a]) = 0 \Rightarrow a \in C$
$\Rightarrow a \in A \cap C \Rightarrow [a] = 0$ in $A/A\cap C$. $b + C$, $b \in B$
$\Rightarrow$ Since $B \subset C$, $b + C = [b] = 0$ in $A+B/C \Rightarrow h$ is onto.