① a) $S = \{\{R, S\}, \{R, T\}, \{R, U\}, \{R, V\}, \{S, T\}, \{S, U\}, \{S, V\}, \{T, U\}, \{T, V\}, \{U, V\}\}$

b) $E = \{\{R, S\}, \{R, T\}, \{R, U\}, \{R, V\}\}$

c) $E = \{\{T, U\}, \{T, V\}, \{U, V\}\}$

③ a) $S = \{HH, HT, TH, TT\}$

b) $E = \{HH, HT\}$

⑪ a) $E \cap F \neq \emptyset$

No, E and F are not mutually exclusive.

b) $F \cap G = \emptyset$

Yes, F and G are mutually exclusive.

(13) In other words, list all subsets of the set S.

$\{a, b, c\}$

$\{a, b\}$

$\{a, c\}$

$\{b, c\}$

$\{a\}$

$\{b\}$

$\{c\}$

$\phi$

(15) $E \cup F = \{1, 2, 3\}$

$E' = \{2, 3, 4\}$

$F' = \{1, 4\}$

$E' \cap F' = \{4\}$

Therefore $(E \cup F) \cap (E' \cap F')$

$= \phi$

Yes, $E \cup F$ and $E' \cap F'$ are mutually exclusive.

(17) The number of heads in 10 coin tosses is what is being observed.

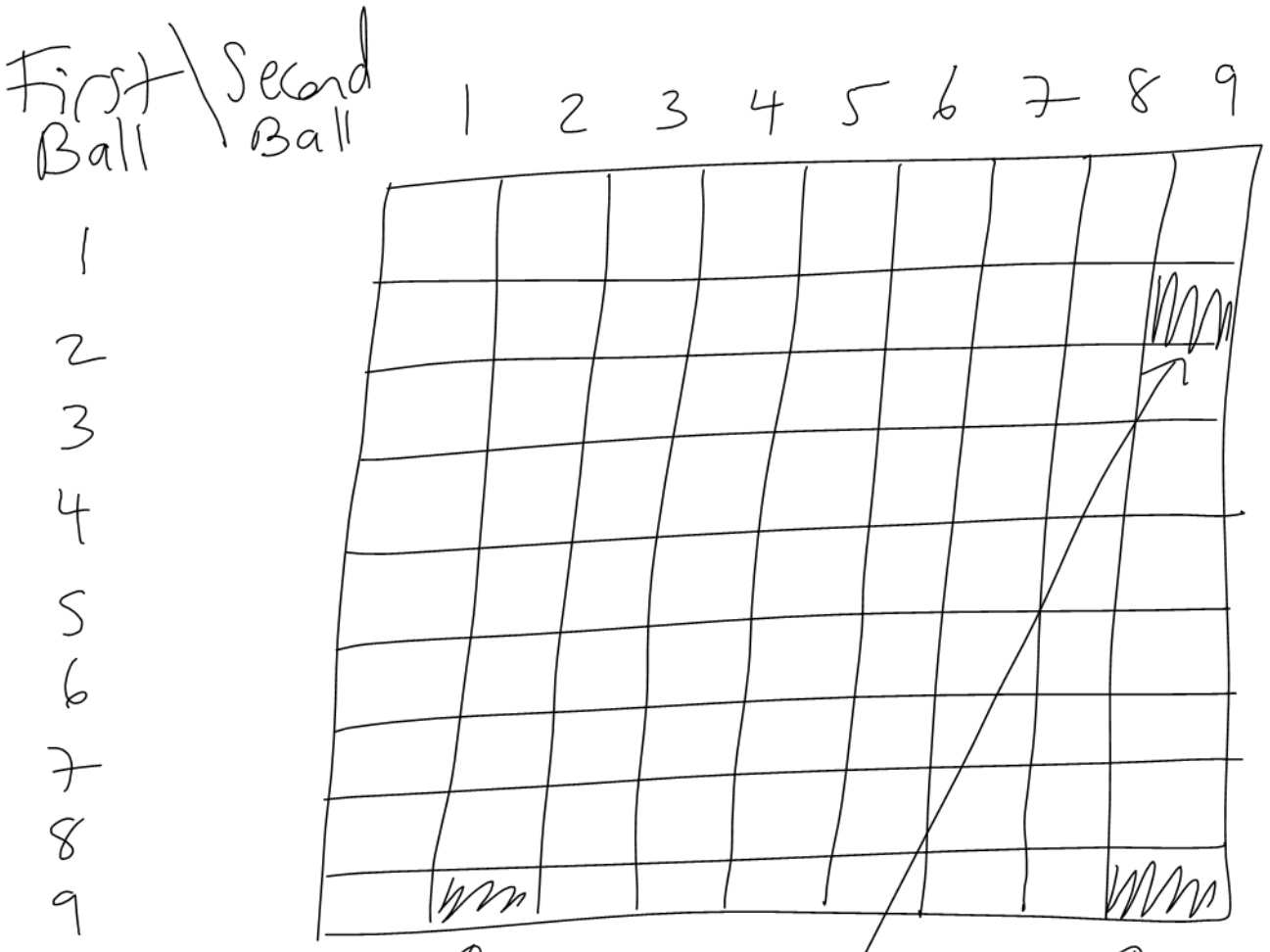
a) $S = \{0, 1, 2, 3, \ldots, 10\}$

b) More heads than tails could be:

6 heads and 4 tails
7 heads and 3 tails
⋮
10 heads and 0 tails

$E = \{6, 7, 8, 9, 10\}$

(23)




this represents drawing 9 then 2 Could write it (9,2)

this represents drawing 9 then 9 Could write it (9,9)

this represents drawing 2 then 9 Could write it (2,9)

Number of outcomes in the sample space = $9 \times 9 = 81$