

Answers to HW #1 (Chapter 2)

2.1 (i) $S = \{(3, 0, 0), (2, 1, 0), (2, 0, 1), (1, 2, 0), (1, 0, 2), (1, 1, 1), (0, 2, 1), (0, 1, 2), (0, 3, 0), (0, 0, 3)\}$.

(ii) $A = \{(1, 1, 1)\}$,
 $B = \{(3, 0, 0)\}$,
 $C = \{(3, 0, 0), (0, 3, 0), (0, 0, 3)\}$,
 $D = \{(2, 1, 0), (2, 0, 1), (3, 0, 0)\}$,
 $E = \{(0, 1, 2), (0, 2, 1)\}$. ■

2.3 (i) $S = \{(1, 2), (1, 3), (1, 4), (1, 5), (2, 1), (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 4), (3, 5), (4, 1), (4, 2), (4, 3), (4, 5), (5, 1), (5, 2), (5, 3), (5, 4)\}$, or
 $S' = \{(1, 2), (1, 3), (1, 4), (1, 5), (2, 3), (2, 4), (2, 5), (3, 4), (3, 5), (4, 5)\}$.

(ii) For the case of the sample space S :

$A = \{(1, 2), (1, 3), (2, 1), (2, 3), (3, 1), (3, 2)\}$,
 $B = \{(4, 5), (5, 4)\}$,
 $C = \{(1, 4), (1, 5), (2, 4), (2, 5), (3, 4), (3, 5), (4, 1), (4, 2), (4, 3), (5, 1), (5, 2), (5, 3)\}$,
 $D = A$.

For the case of the sample space S' :

$A = \{(1, 2), (1, 3), (2, 3)\}$,
 $B = \{(4, 5)\}$,
 $C = \{(1, 4), (1, 5), (2, 4), (2, 5), (3, 4), (3, 5)\}$,
 $D = A$.

Note The sample space S is more suitable in describing this experiment, because it reflects more closely the randomness stipulated. Also, it makes it easier to assign probabilities later on. ■

2.5 (i) $S = \{(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (0, 6), (1, 0), (1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 0), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 0), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6), (4, 0), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 0), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6)\}$.

(ii) $A = \{(3, 0), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6)\}$,
 $B = \{(0, 0), (1, 1), (2, 2), (3, 3), (4, 4), (5, 5)\}$,
 $C = \{(0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (0, 6), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6), (5, 6)\}$,
 $D = \{(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (1, 0), (1, 1), (1, 2), (1, 3), (2, 0), (2, 1), (2, 2), (3, 0), (3, 1), (4, 0)\}$. ■

$$2.7 \ S = \{(-3, 0), (-3, 1), (-3, 2), (-3, 3), (-3, 4), (-2, 0), (-2, 1), (-2, 2), \\ (-2, 3), (-2, 4), (-1, 0), (-1, 1), (-1, 2), (-1, 3), (-1, 4), \\ (0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (1, 0), (1, 1), (1, 2), (1, 3), (1, 4), \\ (2, 0), (2, 1), (2, 2), (2, 3), (2, 4), (3, 0), (3, 1), (3, 2), (3, 3), (3, 4)\},$$

$$A = \{(0, 0), (1, 1), (2, 2), (3, 3)\},$$

$$B = \{(-3, 3), (-2, 2), (-1, 1), (0, 0)\},$$

$$C = \{(-3, 3), (-2, 2), (-1, 1), (0, 0), (1, 1), (2, 2), (3, 3)\},$$

$$D = \{(-2, 0), (-2, 1), (-1, 0), (-1, 1), (-1, 2), (0, 0), (0, 1), \\ (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2, 1)\}. \blacksquare$$