HW 1

problem 1:

(a) $A \cap B$

(b) $A \cup B$

(c) $A^c \cap B^c$ or $(A \cup B)^c$

(d) $A \cap B^c$

problem 2:

(a) $A^c \cap B$: The part has good surface finish and excellent edge finish.

of $A^c \cap B$ is 1

(b) $(A \cap B^c) \cup (A \cap B) = A$: The part has ~~good~~ excellent surface finish

# of A is $69+11 = 80$

(c) $(A \cup B^c) \cap (A \cup B) = A \cap S = A$

(d) $(A \cup B)^c$: The part has good surface finish and good edge finish

$= A^c \cap B^c$

of $A^c \cap B^c$ is 19

P.3.

(a) $S = \{\langle d, nd\rangle, \langle d, d\rangle, \langle nd, d\rangle, \langle nd, nd\rangle\}$

(b) $A_1 = \{\langle d, nd\rangle, \langle d, d\rangle\}$

$A_2 = \{\langle d, d\rangle, \langle nd, d\rangle\}$

$A_1 \cap A_2 = \{\langle d, d\rangle\}$; So A_1 and A_2 are not mutually exclusive.

P.4. Students can treat the die as four-sided or six-sided

$A^c \cap B$: The number on the first die is even and the sum of the numbers is even

$A^c \cap B = \{22, 24, 26, 42, 44, 46, 62, 64, 66\}$

$A \cup B^c$: The number on the first die is odd or the sum of the numbers is odd.

$A \cup B^c = \{$
11, 12, 13, 14, 15, 16
31, 32, 33, 34, 35, 36
51, 52, 53, 54, 55, 56
21, 23, 25,
41, 43, 45,
61, 63, 65 $\}$

P.5. (a) ~~draw 2 aces~~ ~~draw 2 kings~~ ~~$\binom{13}{2} \times \binom{13}{2} = 6084$~~

draw aces, draw kings

$\binom{4}{2} \times \binom{4}{2} = 36$

(b) 3 cards of one kind, 2 cards of another kind

$\left[13 \times \binom{4}{3}\right] \times \left[12 \times \binom{4}{2}\right] = 3744$