1) a $\{HH, HT, TH, TT\}$

b $1/4$

c. $3/4$

d $2/4$.

4a. $1/6 + 1/6 = 2/6$

b. $3/6$

c. $2/6$

5a. $4/52$

b. $13/52$

c. $1 - 2/52 = 50/52$

7a. $5/8$

b. $7/8$

c. $0/8$

8a. $5/8$

b. $8/8$

c. $6/8$.

11a $3/16$

b. $6/16$

c. $1 - 6/16 = 10/16$.

12. $n(S) = {}_{52}C_5$ $\boxed{P(E) = 0.0005}$

$n(E) = {}_{13}C_5$

13. Could be ♡ or ♧ or ♤ or ◊ so $4({}_{13}C_5) = n(E)$

$P(E) = \dfrac{4({}_{13}C_5)}{{}_{52}C_5} \approx \boxed{0.002}$

14. $n(E) = {}_{12}C_5$ $P(E) = \dfrac{{}_{12}C_5}{{}_{52}C_5} \approx \boxed{0.0003}$

$n(S) = {}_{52}C_5$

15. It's king and queen and ...

~~[illegible]~~ only four possible royal flushes exist.

So, $n(E) = 4 \Rightarrow P(E) = \dfrac{4}{{}_{52}C_5} \approx \boxed{0.000002}$.

22. $n(S) = {}_{30}C_6$

$n(E) =$ think "~~all~~ males only chosen"!

${}_{11}C_6$

$P(E) = \dfrac{{}_{11}C_6}{{}_{30}C_6} \approx \boxed{0.0008}$

28. $n(E) = 1$

$n(S) = {}_8P_8$ or $8!$

$P(E) = \dfrac{1}{8!} \approx \boxed{0.000025}$

32a. Not M.E.

b. Not M.E.

42. $n(E) =$ all 6 #'s or 5 #'s $\Rightarrow {}_6C_6 + {}_6C_5 = 7$.

$n(S) = {}_{49}C_6$ $P(E) = \dfrac{7}{{}_{49}C_6} \approx \boxed{0.0000005}$

43a. $6/16$

b. $8/16$

Not M.E. c. $6/16 + 8/16 = 14/16 - 3/16 = \boxed{11/16}$

Not M.E. d. $8/16 + 10/16 = 18/16 - 5/16 = \boxed{13/16}$

57. (see the notes. Just do it for 8 people instead of 35)

62. $n(S) = {}_{20}P_{20} = 20!$

$n(E) = {}_{12}P_{12} = 12! \cdot 8! = {}_8P_8$ $\dfrac{2(n(E))}{20!} \approx \boxed{0.00002}$