1. $\frac{15\cdot 14\cdot 13\cdot 12\cdot 11\cdot 10\cdot 9\cdot 8}{15^8} = \frac{14\cdot 13\cdot 12\cdot 11\cdot 10\cdot 9\cdot 8}{15^7} = 10.1\%$

2. $\left(\frac{5\cdot 4\cdot 7\cdot 6\cdot 5}{10^5}\right)^5 \left(1-\frac{5\cdot 4\cdot 7\cdot 6\cdot 5}{10^5}\right)^3$

3. if event A happens then there are only 6 possible results left 1 of which satisfies event B. so your probability of event B went from $\frac{1}{36}$ to $\frac{1}{6}$ meaning they are not independent.

4. $P = \frac{\binom{4}{1}\binom{13}{5}}{\binom{52}{5}} = \frac{4\cdot\frac{13!}{5!8!}}{\frac{52!}{5!47!}} = \frac{\cancel{4}\cdot\frac{\cancel{13}\cdot 12\cdot 11\cdot 10\cdot 9}{\cancel{5\cdot 4\cdot 3\cdot 2}}}{\frac{\cancel{52}\cdot 51\cdot 50\cdot 49\cdot 48}{\cancel{5\cdot 4\cdot 3\cdot 2}}} = \frac{12\cdot 11\cdot 10\cdot 9}{51\cdot 50\cdot 49\cdot 48}$

E = average rolls

$E\cdot P = 1$

$E = \frac{1}{P} = \frac{51\cdot 50\cdot 49\cdot 48}{12\cdot 11\cdot 10\cdot 9} = \boxed{504.8}$

5. $P(w|s) = \frac{7}{10}$

$P(w|\bar{s}) = \frac{1}{2}$

$P(s) = \frac{3}{4}$

$P(w) = \frac{4}{5}$

Baye's

$P(s|w) = \frac{P(w|s)\cdot P(s)}{P(w)} = \frac{\frac{7}{10}\cdot\frac{3}{4}}{\frac{4}{5}} = \frac{21}{32} = \boxed{65.6\%}$