① RHS $= 1 - P(A) - P(B) = 1 - (P(A) + P(B)) = 1 - (P(A,B) - P(A,$?

a)

② define P = door player selected, H = door host opened has gold

L = the door that played didn't select and host didn't open has gold

$\Omega = \{P, H, L\}$

b) given $P(P) = P(H) = P(L) = \frac{1}{3}$

prob of winning if stayed $= P(P \mid H^c) = \frac{P(P, H^c)}{P(H^c)} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$

prob of winning if moved $= P(L \mid H^c) = \frac{P(L, H^c)}{P(H^c)} = \frac{1}{2}$

③