

# Bimetry - Clex 4 - Solutions

① a)  $P(S \geq 7) = \frac{21}{36} = \frac{7}{12} \approx 0.5833$

b)  $P(S < 7) = 1 - P(S \geq 7) = 1 - \frac{7}{12} = \frac{5}{12} \approx 0.4167$

c)  $P(\text{Both Odd} \cap (S \geq 7)) = \frac{3}{36} = \frac{1}{12} = 0.08333$

d)  $P((\text{Both Odd}) \cup (S \geq 7)) = P(\text{Both Odd}) + P(S \geq 7) - P((\text{Both Odd}) \cap (S \geq 7)) = \frac{9}{36} + \frac{21}{36} - \frac{3}{36} = \frac{27}{36} = \frac{3}{4}$

②

	MI Yes	MI No	
Smoker	55	65	120
Not Smoker	25	125	150
	80	190	270

a)  $P(A) = \frac{120}{270} = 0.444$

$P(A^c) = 1 - P(A) = 0.556$

$P(B) = \frac{80}{270} = 0.296, P(B^c) = 1 - P(B) = 0.704$

b)  $P(A \cap B) = \frac{55}{270} = 0.204$ ; 20.4% of the women in this sample are smoker and had MI

c)  $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0.444 + 0.296 - 0.204 = 0.536$ ;  
53.6% of the women in this sample are smokers or have had MI.

③ a)  $P(H) = \frac{100}{250} = 0.4, P(B) = \frac{120}{250} = 0.48, P(D) = \frac{75}{250} = 0.3$

b)  $P(H \cap B) = \frac{10}{250} = 0.04, P(H \cap D) = \frac{24}{250} = 0.096, P(B \cap D) = \frac{44}{250} = 0.176$

c)  $P(H \cup B) = P(H) + P(B) - P(H \cap B) = 0.4 + 0.48 - 0.04 = 0.84$

$P(H \cup D) = P(H) + P(D) - P(H \cap D) = 0.4 + 0.3 - 0.096 = 0.604$

$P(B \cup D) = P(B) + P(D) - P(B \cap D) = 0.48 + 0.3 - 0.176 = 0.604$

d)  $P(H \cap B \cap D) = 0$

e)  $P(H \cup B \cup D) = P(H) + P(B) + P(D) - P(H \cap B) - P(H \cap D) - P(B \cap D) = 0.868$

f)  $P(H^c \cap B^c \cap D^c) = 1 - P(H \cup B \cup D) = 1 - 0.868 = 0.132$