

Carbon weir

#1  $P(\overline{A \cup B}) = 0.45$

1)  $P(A \cup B) = \boxed{0.55}$

2)  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

~~0.55~~  $0.55 = 0.5 + 0.2 - P(A \cap B)$

$\boxed{0.15} = P(A \cap B)$

3)  $P(A \cup B) + P(A \cap B) - P(B)$   
 $0.55 + 0.15 - 0.2 = \boxed{0.5}$

4) No,  $P(A \cap B) \neq 0$

#2

1)  $\frac{5}{6} \cdot \frac{5}{6} \cdot \frac{5}{6} \cdot \frac{5}{6} = \frac{625}{1296}$   $1 - \frac{625}{1296} = \boxed{0.5177}$

2)  $1 - \left(\frac{5}{6}\right)^{20} = \boxed{0.974}$

3)  $1 - \left(\frac{5}{6}\right)^x = 0.90$

$\left(\frac{5}{6}\right)^x = 0.1$

$\log_{5/6}(0.1) = 12.6 \approx \boxed{13}$

#3 Evens =  $\frac{2}{9}$  odds =  $\frac{1}{9}$

$$\frac{2}{9} + \frac{2}{9} + \frac{1}{9} + \frac{1}{9} = \frac{6}{9} = \frac{2}{3} = \boxed{0.666}$$

#4

~~Ans: P1~~

$$\boxed{P_1 \cdot P_2}$$

#5

a)  $\frac{4}{52} = \boxed{0.0769}$

b)  $\frac{1}{52} = \boxed{0.0192}$

c)  $\frac{2}{52} = \boxed{0.0385}$

d)  $\boxed{0.5}$

#6)  $P(H_1) = \frac{13}{52} = \boxed{0.25}$

$$P(H_2) = \frac{12}{51} = \boxed{0.235}$$