

Key Probability Formulas

$$\textcircled{*} P(A \text{ or } B) = \boxed{0.4} + \boxed{0.2} = 0.6$$

$\uparrow$   $P(A)$                        $\uparrow$   $P(B)$

IF  $A, B$  "mutually exclusive"

If  $P(X)=0.4$   
and  $P(Y)=0.2$   
and  $X, Y$   
are mutually  
exclusive

$$\textcircled{*} P(A \text{ or } B) = \boxed{0.4} + \boxed{0.2} - \boxed{0.1}$$

$\uparrow$   $P(A)$                        $\uparrow$   $P(B)$                        $\uparrow$   $P(A \text{ and } B)$

$\textcircled{*}$  Same as above, but  $P(A \text{ and } B)=0.1$   
 $\boxed{0.5}$

$$\textcircled{*} P(A \text{ and } B) = \boxed{\frac{1}{6}} \cdot \boxed{\frac{1}{6}} = \frac{1}{36}$$

$\uparrow$   $P(A)$                        $\uparrow$   $P(B)$

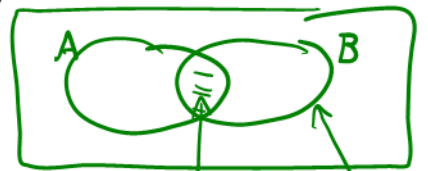
IF  $A, B$  independent

Roll a 6  
"4"  
then  
Roll "1"

CONDITIONAL PROBABILITY

$$\textcircled{I} P(A|B) = \frac{\boxed{0.2}}{\boxed{0.6}}$$

$\leftarrow P(A \text{ and } B)$                        $\leftarrow P(B)$



$P(B)=0.6$   
 $P(A \text{ and } B)=0.2$

$$\textcircled{II} P(A \text{ and } B) = \boxed{0.3} \cdot \boxed{0.2} = \boxed{0.06}$$

$\uparrow$   $P(A|B)$                        $\uparrow$   $P(B)$

Probability of being smoker = 0.2  
Probability of getting  
cancer given a smoker = 0.3

Complement

$$P(A^c) = 1 - \boxed{0.4}$$

$\uparrow$   $P(A)$

Probability of rain = 0.4  
Probability of  
not rain  
 $\boxed{0.6}$