

## Addition Rule

Mutually Exclusive - When two events A and B cannot occur at the same time.



Mutually  
Exclusive



Not Mutually Exclusive.

Ex. 1) A: Roll a 3 ) Mutually Exclusive  
B: Roll a 4

2) A: Roll a 3 ) Not Mutually  
B: Roll an Odd Number ) E.

3) A) select a Male ) Not  
B) select a Nursing Student

Addition Rule of Probability

$P(A)$  — Probability of Event A

$P(B)$  - Probability of Event B

The Probability that Events

A or B will occur  $P(A \text{ or } B)$  is:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

IF A and B are Mutually Exclusive  
then the rule simplifies to  $P(A) + P(B)$ .

Cards

 $P(4)$  or  $P(\text{Ace})$ 

$$\frac{4}{52} + \frac{4}{52}$$

$$\frac{1}{13} + \frac{1}{13} = \boxed{\frac{2}{13}}$$

Roll a die

 $P(\text{Less than } 3)$ or  
rolling an odd

$$\frac{2}{6} + \frac{3}{6} - \left(\frac{2}{6} \cdot \frac{3}{6}\right)$$

$$\frac{5}{6} - \frac{6}{36}$$

$$\frac{5}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$$

$$\frac{75 - 99}{100 - 125} = \frac{7}{9} \quad 36 \text{ months}$$

$$\frac{7}{36} + \frac{9}{36} = \frac{16}{36} = \frac{4}{9}$$

Blood Bank

$$P(O) + P(A)$$

$$a) \frac{184}{409} + \frac{164}{409} = \frac{348}{409}$$

$$b) P(B) + P(Rh^-) - P(B \text{ and } Rh^-)$$

$$\frac{45}{409} + \frac{65}{409} - \left( \frac{45}{409} \times \frac{65}{409} \right)$$

$$\frac{110}{409} - 0.017 \frac{2925}{167281}$$

$$0.269 - 0.017 = 0.252$$

