

# ASSIGNMENT 3

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## 1 Question :

Two dice are thrown . The events A,B and C are as follows:

A: getting an even number on first dice

B: getting an odd number on first dice

C: getting sum of the number on the dice less than or equal to 5

Describe the events

1. A' 2. not B 3. A or B 4. A and B 5. A but not C 6. B or C 7. B and C 8. A and B' and C'

Answer: The sample space for throwing two dice is:-

$S = \{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{1,5\}, \{1,6\}, \{2,1\}, \{2,2\}, \{2,3\}, \{2,4\}, \{2,5\}, \{2,6\}, \{3,1\}, \{3,2\}, \{3,3\}, \{3,4\}, \{3,5\}, \{3,6\}, \{4,1\}, \{4,2\}, \{4,3\}, \{4,4\}, \{4,5\}, \{4,6\}, \{5,1\}, \{5,2\}, \{5,3\}, \{5,4\}, \{5,5\}, \{5,6\}, \{6,1\}, \{6,2\}, \{6,3\}, \{6,4\}, \{6,5\}, \{6,6\}\}$

The three events A,B and C are defined below:-

$A = \{\{2,1\}, \{2,2\}, \{2,3\}, \{2,4\}, \{2,5\}, \{2,6\}, \{4,1\}, \{4,2\}, \{4,3\}, \{4,4\}, \{4,5\}, \{4,6\}, \{6,1\}, \{6,2\}, \{6,3\}, \{6,4\}, \{6,5\}, \{6,6\}\}$   
 $B = \{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{1,5\}, \{1,6\}, \{3,1\}, \{3,2\}, \{3,3\}, \{3,4\}, \{3,5\}, \{3,6\}, \{5,1\}, \{5,2\}, \{5,3\}, \{5,4\}, \{5,5\}, \{5,6\}\}$   
 $C = \{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{2,1\}, \{2,2\}, \{2,3\}, \{3,1\}, \{3,2\}, \{4,1\}\}$

Describe the events 1. A' 2. not B 3. A or B 4. A and B 5. A but not C 6. B or C 7. B and C 8. A and B' and C

1. A'-Getting an odd number on the first dice

$A' = \{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{1,5\}, \{1,6\}, \{3,1\}, \{3,2\}, \{3,3\}, \{3,4\}, \{3,5\}, \{3,6\}, \{5,1\}, \{5,2\}, \{5,3\}, \{5,4\}, \{5,5\}, \{5,6\}\}$

2. not B- Getting an even number on the first dice

$B' = \{\{2,1\}, \{2,2\}, \{2,3\}, \{2,4\}, \{2,5\}, \{2,6\}, \{4,1\}, \{4,2\}, \{4,3\}, \{4,4\}, \{4,5\}, \{4,6\}, \{6,1\}, \{6,2\}, \{6,3\}, \{6,4\}, \{6,5\}, \{6,6\}\}$

3. A or B- getting even number or getting an odd number on first dice.

$A \text{ or } B = \{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{1,5\}, \{1,6\}, \{2,1\}, \{2,2\}, \{2,3\}, \{2,4\}, \{2,5\}, \{2,6\}, \{3,1\}, \{3,2\}, \{3,3\}, \{3,4\}, \{3,5\}, \{3,6\}, \{4,1\}, \{4,2\}, \{4,3\}, \{4,4\}, \{4,5\}, \{4,6\}, \{5,1\}, \{5,2\}, \{5,3\}, \{5,4\}, \{5,5\}, \{5,6\}, \{6,1\}, \{6,2\}, \{6,3\}, \{6,4\}, \{6,5\}, \{6,6\}\}$

4. A and B =Getting an odd and even number on first dice.

A and B=NULL

5. A but not C- Getting an even number on the first dice and the sum is more than 5.

A but not C =  $\{\{2,4\}, \{2,5\}, \{2,6\}, \{4,2\}, \{4,3\}, \{4,4\}, \{4,5\}, \{4,6\}, \{6,1\}, \{6,2\}, \{6,3\}, \{6,4\}, \{6,5\}, \{6,6\}\}$

6. B or C =  $\{\{1,1\}, \{1,2\}, \{1,3\}, \{1,4\}, \{1,5\}, \{1,6\}, \{3,1\}, \{3,2\}, \{3,3\}, \{3,4\}, \{3,5\}, \{3,6\}, \{5,1\}, \{5,2\}, \{5,3\}, \{5,4\}, \{5,5\}, \{5,6\}\}$

7. B and C- Getting an odd number on the first dice and sum is less than or equal to 5

B and C =  $\{\{1,1\},\{1,2\},\{1,3\},\{1,4\},\{3,1\},\{3,2\},\{3,3\}\}$

8. A and B' and C'-Getting an even number on the first dice and sum on both dice is greater than 5.

A and B' and C' =  $\{\{2,4\},\{2,5\},\{2,6\},\{4,2\},\{4,3\},\{4,4\},\{4,6\},\{6,1\},\{6,2\},\{6,3\},\{6,4\},\{6,5\},\{6,6\}\}$