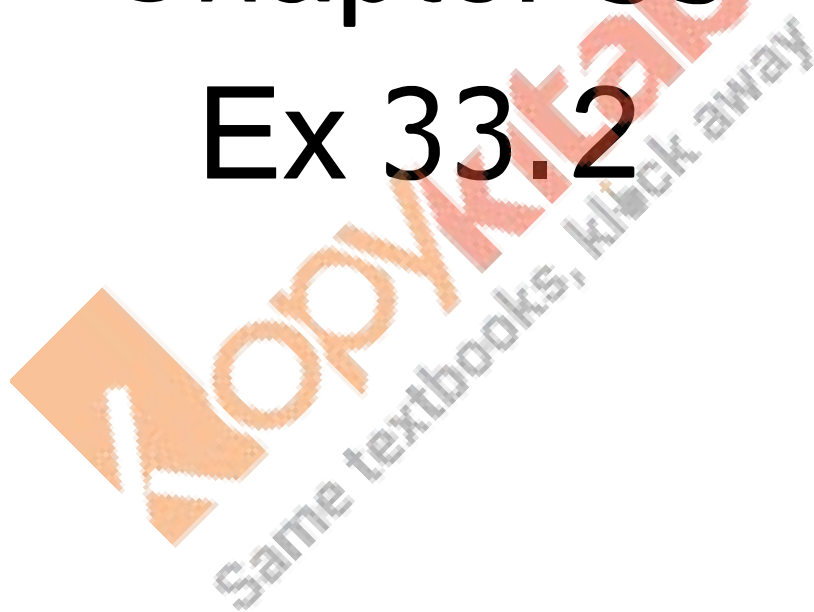# RD Sharma Solutions

Class 11 Maths

Chapter 33

Ex 33.2

RD Sharma Class 11 Solutions Chapter-33 Probability Ex 33.2 Q1

Since a coin is tossed, so the total nos of elementary events is

$$S = \{H, T\}$$

$\Rightarrow \quad n(s) = 2$

Also, the total no. of events

$$= \{H\}, \ \{T\}, \ \{H, T\}, \ \{T, H\}$$

$$= 4$$

Probability Ex 33.2 Q2

Since we are tossing two coins so, the all events associated with random experiment are

$$\{HH\}, \ \{HT\}, \ \{TH\}, \ \{TT\}, \ \{HH, HT\}, \ \{HH, TH\}, \ \{HH, TT\}, \ \{HT, TH\}, \ \{HT, TT\},$$
$$\{TH, TT\} \{HH, HT, TH\}, \{HH, HT, TT\}, \ \{HH, TH, TT\}, \ \{HT, TH, TT\}, \ \{HH, HT, TH, TT\},$$

Total=15

From above the elementory events are $\{HH\}, \ \{HT\}, \ \{TH\}, \ \{TT\}$

Total elementory event=4

Probability Ex 33.2 Q3

A - Getting three heads = {HHH} = 1
B - Getting two heads and one tail = {HHT,THH,HTH} = 3
C - Getting three tails = {TTT} = 1
D - Getting a head on the first coin = {HHH,HHT,HTH,HTT} = 4

i) Which pairs of events are mutually exclusive?

We know that A and B are said to be mutually exclusive if $A \cap B = \phi$

a) A and B   b) A and C   c) B and C   d) C and D are mutually exclusive

ii) Which events are elementary events?

A and C are elementary events.

iii) Which events are compound events?

Clearly B and D are union of three events and 4 events respectively.

∴ B and D are compound events.

Probability Ex 33.2 Q4

Since a die was thrown. So elementary events are

{1}, {2}, {3}, {4}, {5}, {6}

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

ii) B = Getting a number greater than 7.

$B = \phi$ [∵ A die has 1,2,3,4,5,6 members only]

iii) C = Getting a multiple of 3.

$C = \{3,6\}$

iv) D = Getting a number less than 4.

$D = \{1,2,3\}$

v) E = Getting an even number greater than 4.

$E = \{6\}$

vi) F = Getting a number not less than 3.

$F = \{3,4,5,6\}$

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

$A \cap B = \{\phi\}$

$B \cap C = \{\phi\}$

$E \cap F = \{6\}$

$D \cap F = \{3\}$

$\overline{F} = 1 - F = \{1,2\}$

Probability Ex 33.2 Q5

Sample space associated with given event is

S= { HHH, HHT, THH, HTH, HTT, THT, TTH, TTT}

(i) A={HTT, THT, TTH}, B={HHT, THH, HTH}

A and B are mutually exclusive events

(ii) A={HHH, TTT}, B={HHT, THH, HTH} and

C = {HTT, THT, TTH}

Above events are exhaustive and mutually exclusive events.

Becasue $A \cap B = B \cap C = C \cap A = \emptyset$ and $A \cup B \cup C = S$

(iii) A={HHH, HHT, THH, HTH}

B={HHT, THH, HTH, HTT, THT, TTH, TTT}

A and B are not mutualy exclusive becasue $A \cap B = \emptyset$

(iv) A={HHH, HHT, THH}, B={THT, TTH, TTT}

A and B are mutually exclusive but not exhaustive

$A \cap B = \emptyset$ and $A \cup B \neq S$

Probability Ex 33.2 Q6

(i)

A=both numbers are odd

={(1,1), (1,3), (1,5), (3,1), (3,3), (3,5),(5,1), (5,3), (5,5)}

(ii)

B=both numbers are even

={(2,2), (2, 4), (2,6), (4,2), (4, 4), (4,6), (6,2), (6, 4), (6,6)}

(iii)

C=Sum of numbers is less than 6

={(1,1), (1,2), (1,3), (1,4), (1,5), (2,1), (2,2), (2,3), (3,1), (3,2), (4,1)}

$A \cup B$={(1,1), (1,3), (1,5), (3,1), (3,3), (3,5),(5,1), (5,3), (5,5), (2,2),
(2, 4), (2,6), (4,2), (4, 4), (4,6), (6,2), (6, 4), (6,6)}

$A \cap B = \emptyset$

$A \cup C$={(1,1), (1,2), (1,3), (1,4), (1,5), (2,1), (2,2), (2,3), (3,1), (3,2),
(4,1), (3,3), (3,5),(5,1), (5,3), (5,5)}

$A \cap C$={(1,1), (1,3), (3,1)}

$B \cap C = \emptyset$

A = Getting an even number on the first die.

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 = Getting an odd number on the first die.

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 = Getting at most 5 as sum of the numbers on the two dice.

C={(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (3,1), (3,2), (4,1)}

D = Getting the sum of the numbers on the dice > 5 but < 10.

D={(1,5), (1,6), (2,4), (2,5), (2,6), (3,3), (3,4), (3,5), (3,6)

(4,2), (4,3), (4,4), (4,5), (5,1), (5,2), (5,3), (5,4), (6,1), (6,2), (6,3)}

E = Getting at least 10 as the sum of the numbers on the dice.

E={(4,6), (5,5), (5,6), (6,4), (6,5), (6,6)}

F = Getting an odd number on one of the dice.

F={(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) (2,1), (2,3), (2,5),

(4,1), (4,3), (4,5), (6,1), (6,3), (6,5)}

Its clear that A and B are mutually exclusive events and $A \cap B = \varnothing$

$B \cup C = \{(1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (3,1), (3,2), (3,3),$

$(3,4), (3,5), (3,6), (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), (2,1), (2,2), (2,3),$

$(4,1)\}$

$B \cap C = \{(1,1), (1,2), (1,3), (1,4), (3,1), (3,2)\}$

$A \cap E = \{(4,6), (6,4), (6,5), (6,6)\}$

$A \cup F = \{(2,1), (2,2), (2,3), (2,4), (2,5), (2,6),$

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

(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)}

$A \cap F = \{(2,1), (2,3), (2,5), (4,1), (4,3), (4,5), (6,1), (6,3), (6,5)\}$

(ii)

a)T $A \cap B = \varnothing$ b)T $A \cap B = \varnothing$ and $A \cup B = S$

c)F $A \cap C \neq \varnothing$ d)F $A \cap B = \varnothing$ and $A \cup B \neq S$

e)T $C \cap D = D \cap E = C \cap E = \varnothing$ and $C \cup D \cup E = S$

f)T $A^1 \cap B^1 = \varnothing$ g)F $A \cap F \neq \varnothing$

We have four slips of paper with numbers 1,2,3 & 4.

A person draws two slips without replacement.

∴ Number of elementary events = $^4C_2$

∴ $$n(s) = \frac{4 \times 3}{2 \times 1} = 6$$

A = The number on the fist slip is larger than the one on the second slip

$$A = \{(2,1),\ (3,1),\ (3,2),\ (4,1),\ (4,2),\ (4,3)\}$$

B = The number on the second slip is greater than 2

∴ $$B = \{(1,3),\ (2,3),\ (1,4),\ (2,4),\ (3,4),\ (4,3)\}$$

C = The sum of the numbers on the two slips is 6 or 7

∴ $$C = \{(2,4),\ (3,4),\ (4,2),\ (4,3)\}$$

and,

D = The number on the second slips is twice that on the first slip

$$D = \{(1,2),\ (2,4)\}$$

and, A and D form a pair of mutually exclusive events as $A \cap B = \phi$

Probability Ex 33.2 Q9

(i)

Sample space for picking up a card from a set of 52 cards is

set of 52 cards itself

(ii)

For an event of chosen card be black faced card,

event is a set of jack, king, queen of spades and clubs