

CLASS – 10

MATHEMATICS

CH – 14

PROBABILITY

CBSE Board

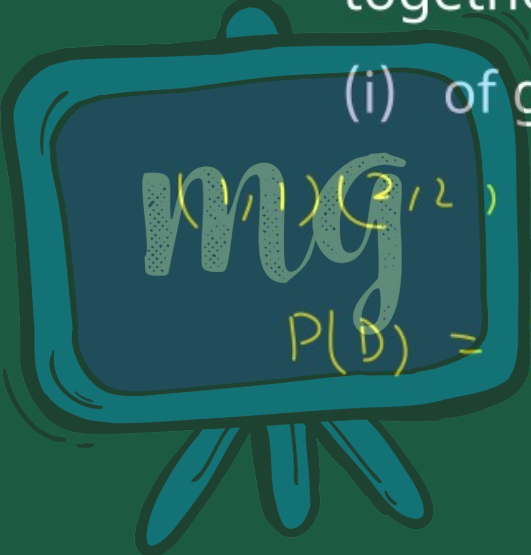
Most Important Questions – 1

Shubham Tiwari

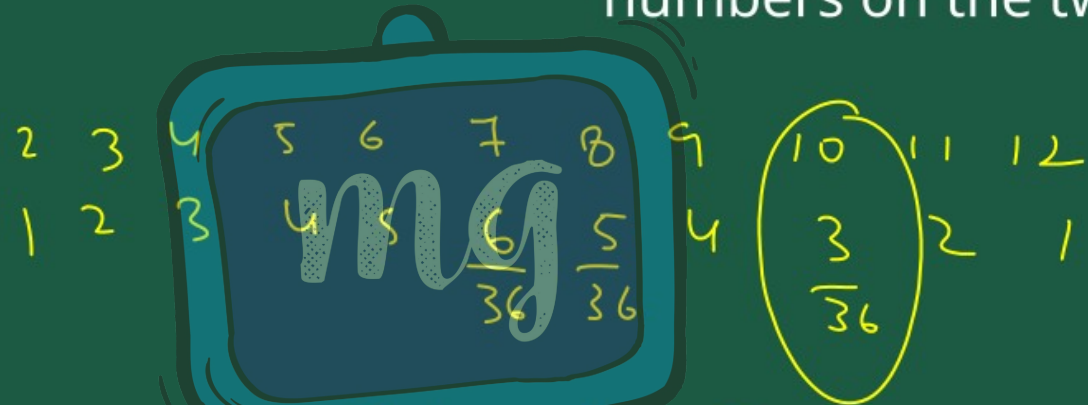


1. Two different dice are tossed together. Find the probability :

(i) of getting a doublet


$$(1,1) (2,2) (3,3) (4,4) (5,5) (6,6)$$
$$P(D) = \frac{\text{Favorable o/c}}{\text{Total o/c}} = \frac{6}{36} = \frac{1}{6}$$

(ii) of getting a sum 10 of the numbers on the two dice.



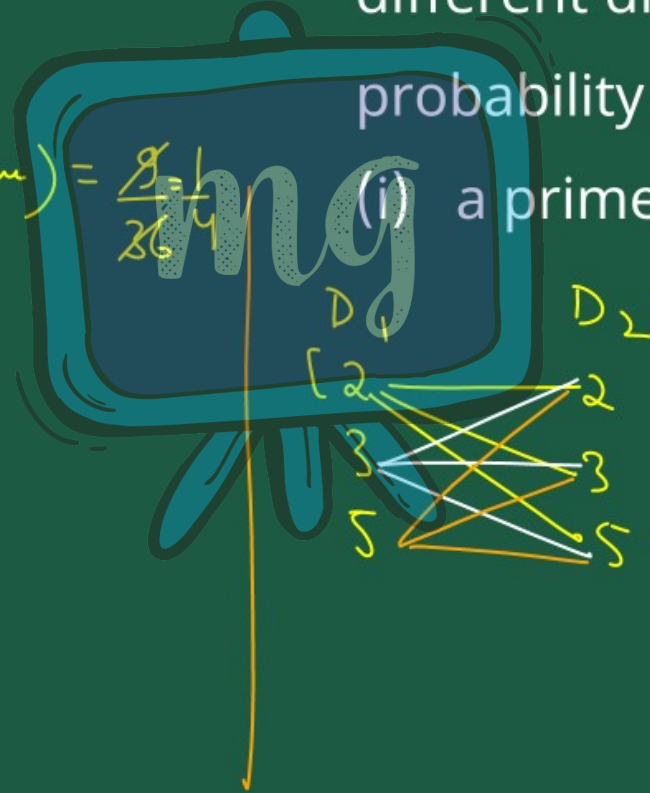
$$P(S=10) = \frac{\text{Favou/c}}{\text{Total oc}} = \frac{3}{36} = \frac{1}{12}$$

(5,5) (6,4) (4,6)

2. In a single throw of a pair of different dice, what is the probability of getting

(i) a prime number on each dice?

$$P(\text{Prime}) = \frac{8}{26} = \frac{4}{13}$$



- $(2, 2)$ $(2, 3)$ $(2, 5)$
- $(3, 2)$ $(3, 3)$ $(3, 5)$
- $(5, 2)$ $(5, 3)$ $(5, 5)$

(ii) a total of 9 or 11?

Sum of 9 \rightarrow (3,6) (6,3) (4,5) (5,4)

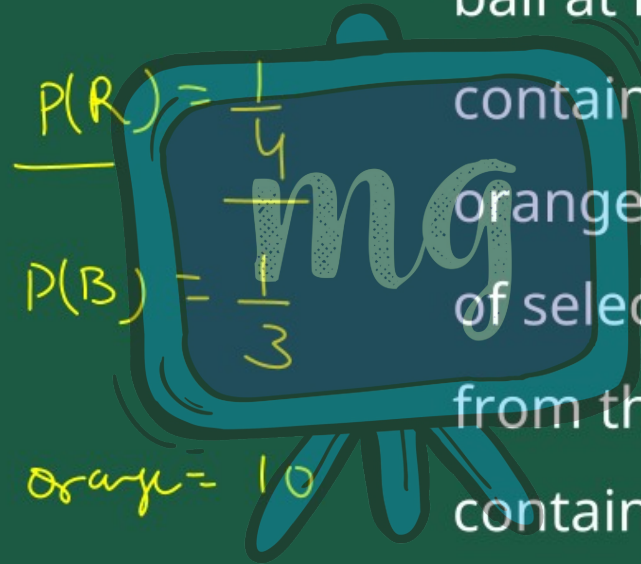
Sum of 11 \rightarrow (6,5) (5,6)



$$P(\text{Sum of 9 or 11}) = \frac{\text{Fav out}}{\text{Total out}}$$

$$= \frac{6}{36} = \frac{1}{6}$$

3. The probability of selecting a red ball at random from a jar that contains only red, blue and orange balls is $\frac{1}{4}$. The probability of selecting a blue ball at random from the same jar is $\frac{1}{3}$. If the jar contains 10 orange balls, find the total number of balls in the jar.



No. of orange balls = $\frac{100^2}{T}$

No. of Total Balls = $\frac{7}{12} + P(O) = 1$

$\frac{100^2}{T} = \frac{7}{12}$

$T = 24$

$R + B + O = 1$

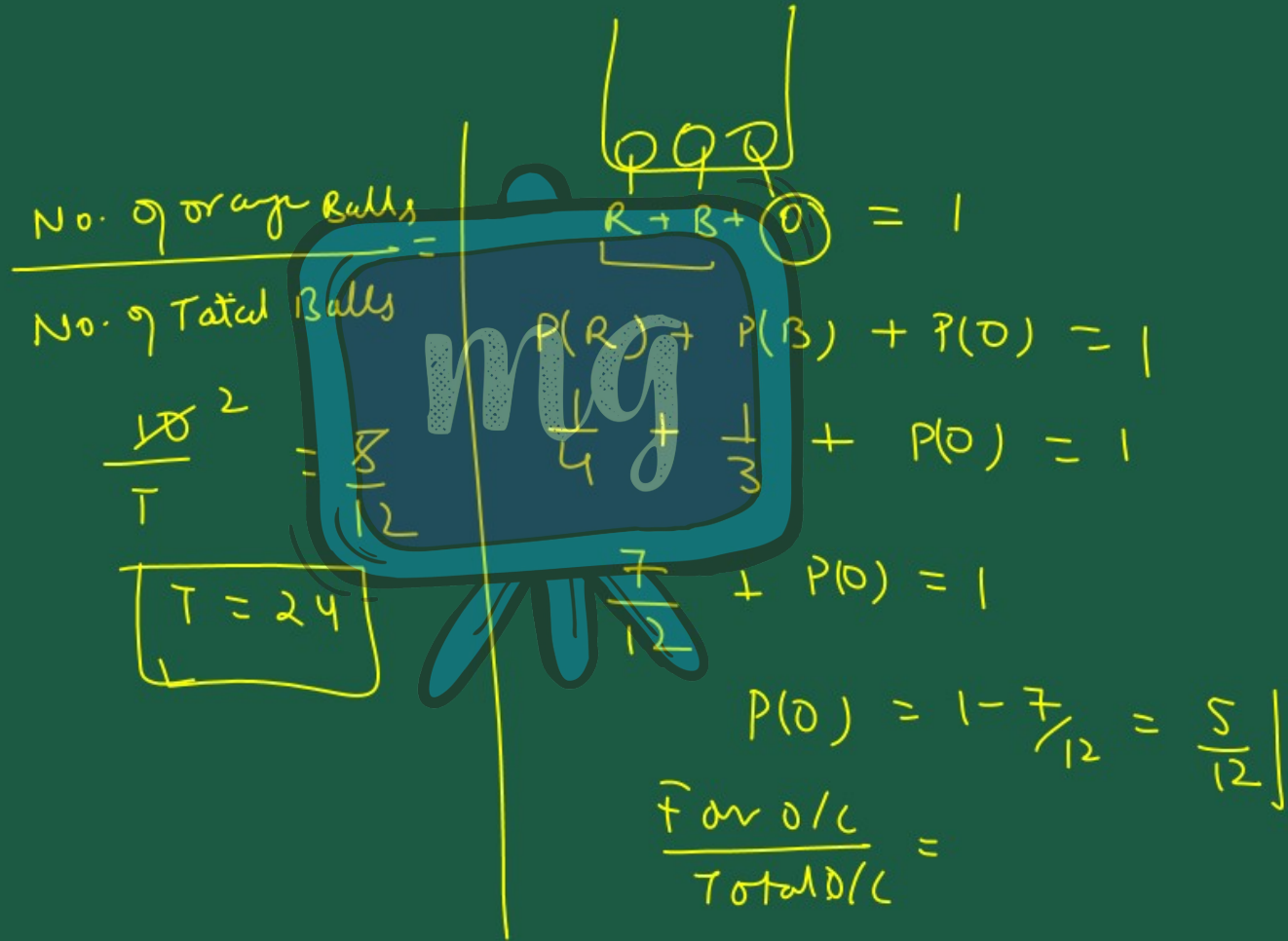
$P(R) + P(B) + P(O) = 1$

$\frac{1}{4} + \frac{1}{3} + P(O) = 1$

$\frac{7}{12} + P(O) = 1$

$P(O) = 1 - \frac{7}{12} = \frac{5}{12}$

$\frac{\text{Fav o/c}}{\text{Total o/c}} =$



4. A bag contains, white, black and red balls only. A ball is drawn at random from the bag. If the probability of getting a white ball is $\frac{3}{10}$ and that of a black ball is $\frac{2}{5}$, then find the probability of getting a red ball. If the bag contains 20 black balls, then find the total number of balls in the bag.

1000
W B R

$$P(W) = \frac{3}{10}$$
$$P(B) = \frac{2}{5}$$

Black = 20

$$P(W) + P(B) + P(R) = 1$$

$$\frac{3}{10} + \frac{4}{10} + P(R) = 1$$

$$\frac{7}{10} + P(R) = 1$$

$$P(R) = 1 - \frac{7}{10} = \frac{3}{10}$$

$$P(B) = \frac{\text{Black Balls}}{\text{Total Balls}} = \frac{2}{5}$$

$$= \frac{\frac{10}{20}}{\text{Total}} = \frac{2}{5}$$

Total Balls = 50

5. A bag contains 18 balls out of which x balls are red.

$$\text{Total Balls} = 18$$

$$\text{Red} = x$$

$$P(R) = \frac{x}{18}$$

$$P(\bar{R}) = 1 - P(R)$$

$$= 1 - \frac{x}{18} = \frac{18-x}{18}$$

(i) If one ball is drawn at random from the bag, what is the probability that it is not red?

(ii) If 2 more red balls are put in the bag, the probability of drawing a red ball will be $\frac{9}{8}$ times the probability of drawing a red ball in the first case. Find the value of x .

$$\text{Red} = \frac{x+2}{18+2}$$

$$P(R') = \frac{x+2}{20}$$

$$P(R) = \frac{x}{18}$$

$$P(R) \times \frac{9}{8} = P(R')$$

$$\frac{x}{18} \times \frac{9}{8} = \frac{x+2}{20}$$

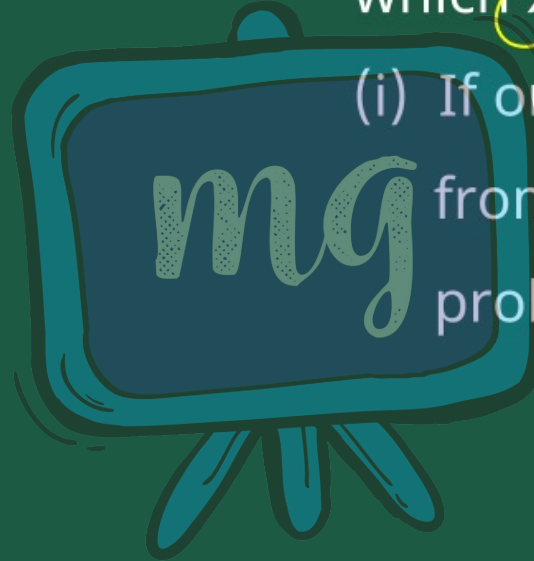
$$5x = 4(x+2)$$

$$5x = 4x + 8$$

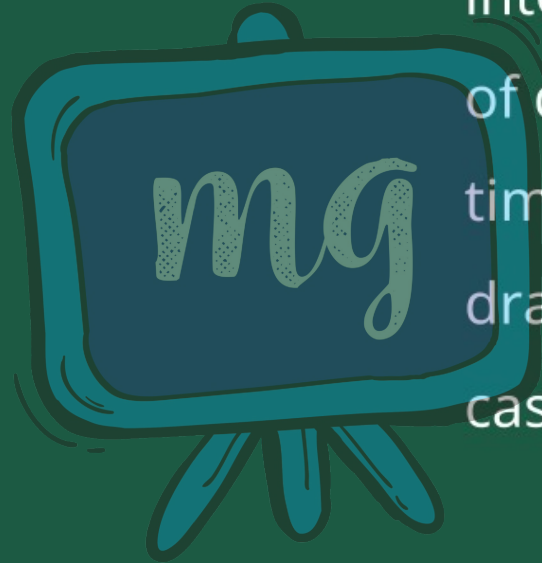
$$\boxed{x = 8}$$

6. A bag contains 20 balls out of which x balls are red.

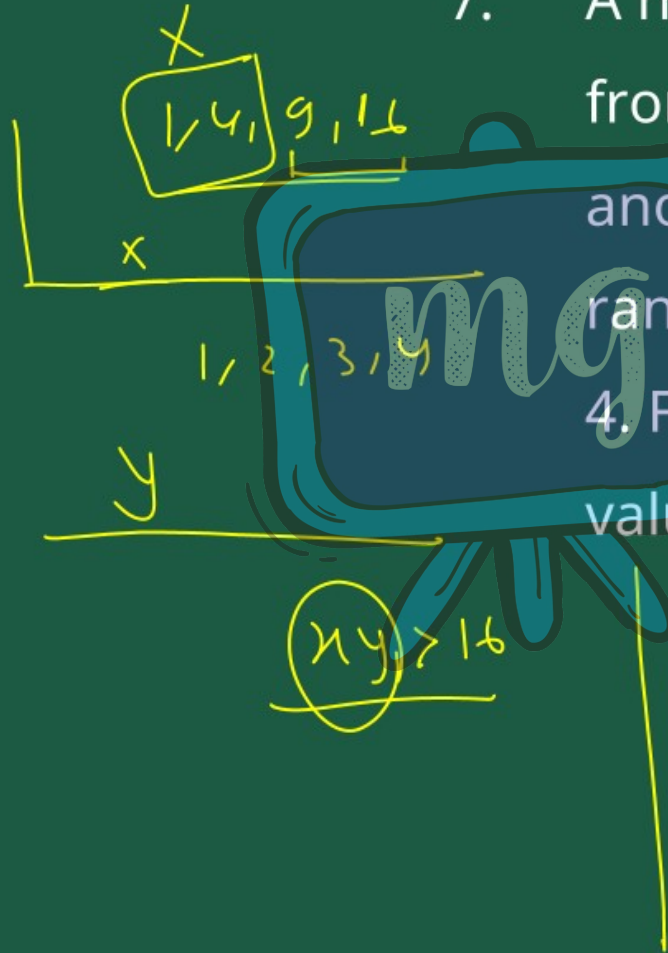
(i) If one ball is drawn at random from the bag, find the probability that it is not red.



(ii) If 4 more red balls are put into the bag, the probability of drawing a red ball will be $\frac{5}{4}$ times the probability of drawing a red ball in the first case. Find the value of x .

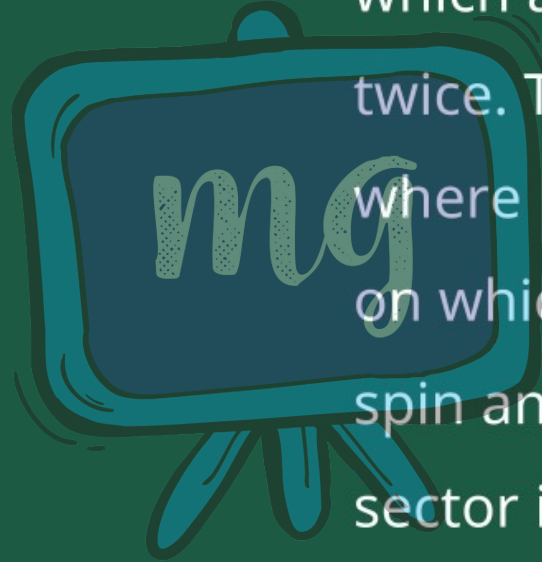


7. A number x is selected at random from the numbers 1, 4, 9, 16 and another number y is selected at random from the numbers 1, 2, 3, 4. Find the probability that the value of xy is more than 16.



$$\begin{aligned} & (9, 2) (9, 3) (9, 4) \\ & (16, 2) (16, 3) (16, 4) \\ & = \frac{6}{16} = \frac{3}{8} \end{aligned}$$

8. The given figure shows a disc on which a player spins an arrow twice. The fraction $\frac{a}{b}$ is formed, where 'a' is the number of sector on which arrow stops on the first spin and 'b' is the number of the sector in which the arrow stops on second spin.

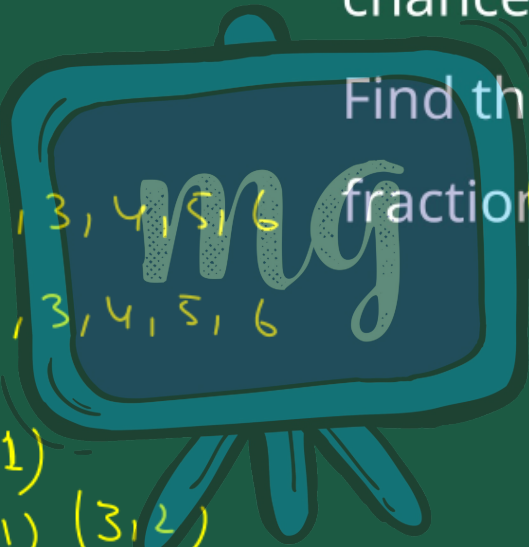


On each spin, each sector has equal chance of selection by the arrow.

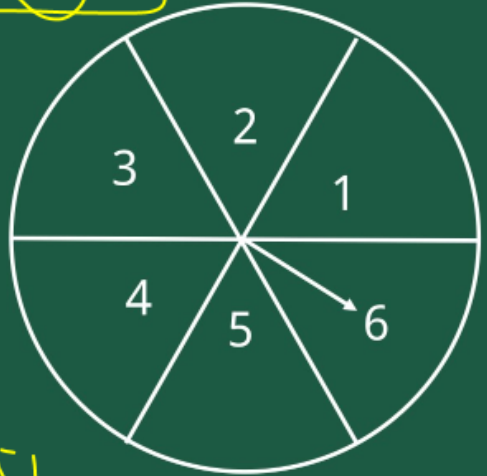
Find the probability that the

fraction $\frac{a}{b} > 1$.

$$\frac{a}{b} = \frac{1, 2, 3, 4, 5, 6}{1, 2, 3, 4, 5, 6}$$



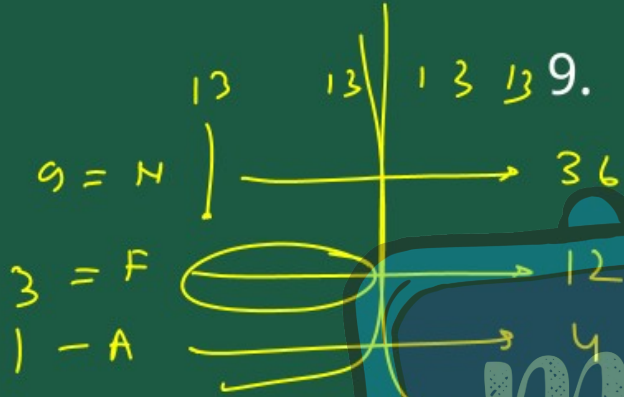
- (2, 1)
- (3, 1) (3, 2)
- (4, 1) (4, 2) (4, 3)
- (5, 1) (5, 2) (5, 3) (5, 4)
- (6, 1) - - - (6, 5)



$$P(a/b) = \frac{\text{Fav o/c}}{\text{Total o/c}}$$



$$= \frac{15}{36}$$



All the black face cards are removed from a pack of 52 playing cards. The remaining cards are well shuffled and then a card is drawn at random. Find the probability of getting a

Now Total cards = 46

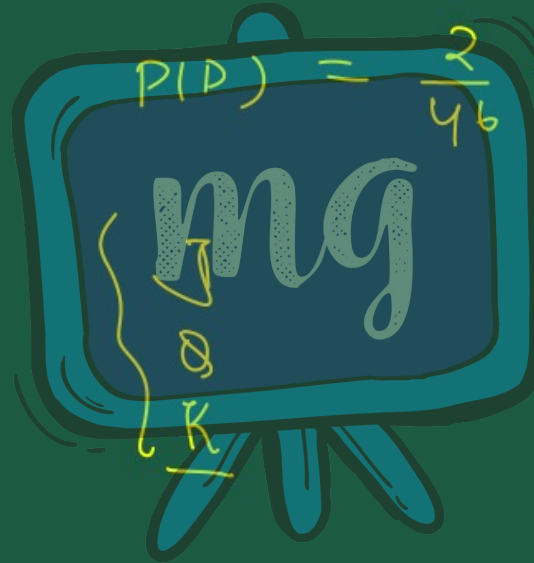
$$P(A) = \frac{6}{46} = \frac{3}{23}$$

$$P(B) = \frac{26}{46} = \frac{13}{23}$$

- A. face card B. red card
- C. black card D. king

$$P(B) = \frac{20}{46} = \frac{10}{23}$$

$$P(D) = \frac{2}{46} = \frac{1}{23}$$



10. Red queens and black jacks are removed from a pack of 52 playing cards. A card is drawn at random from the remaining cards, after reshuffling them. Find the probability that the drawn card is

R Q	4-2
B Jack	4-2
Total card =	<u>48</u>

$$P(A) = \frac{4}{48} = \frac{1}{12}$$

$$P(B) = \frac{24}{48} = \frac{1}{2}$$

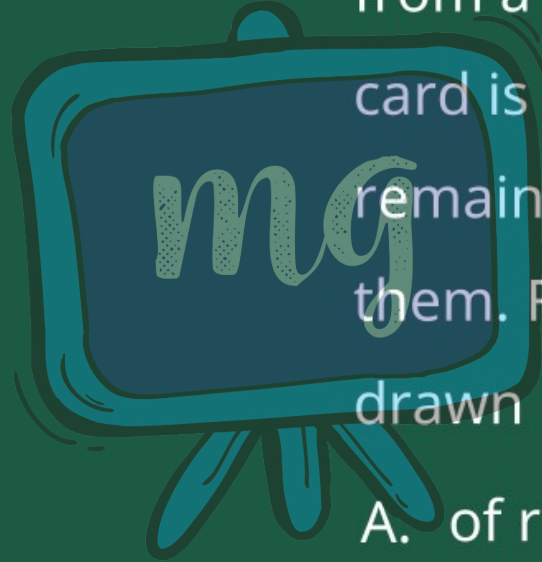
$$P(C) = \frac{8}{48} = \frac{1}{6}$$

- A. a king B. of red colour
C. a face card D. a queen

$$P(D) = \frac{2}{48} = \frac{1}{24}$$



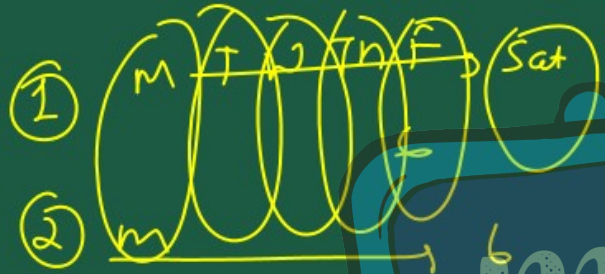
11. All the red face cards are removed from a pack of 52 playing cards. A card is drawn at random from the remaining cards, after reshuffling them. Find the probability that the drawn card is



- A. of red colour
- B. a queen
- C. an ace
- D. a face card

12. Two customers are visiting a particular shop in the same week (Monday to Saturday). Each is equally likely to visit the shop on any one day as on another. What is the probability that both will visit the shop on :

(i) the same day?

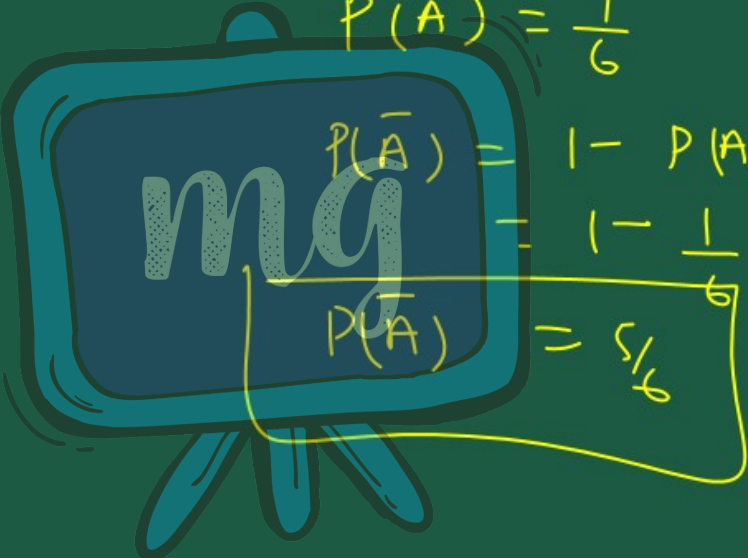


$$\text{Total} = \frac{36}{}$$

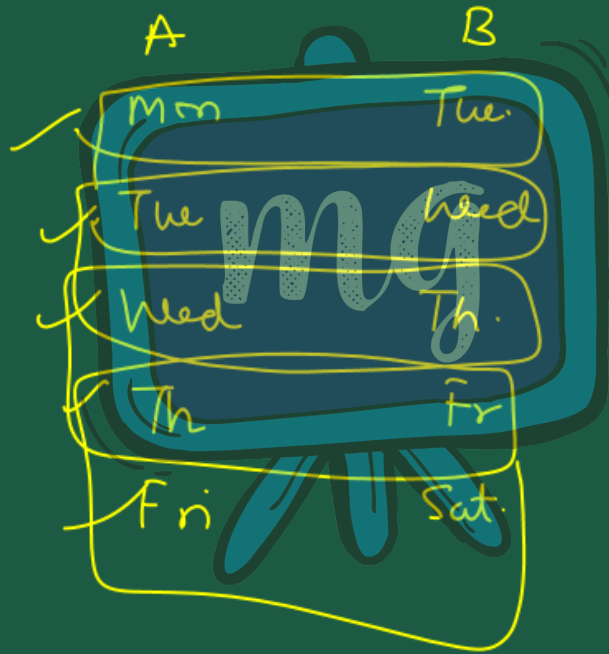
$$P(\text{same day}) = \frac{6}{36}$$

$$= \frac{1}{6}$$

(ii) different days?


$$P(A) = \frac{1}{6}$$
$$P(\bar{A}) = 1 - P(A)$$
$$= 1 - \frac{1}{6}$$
$$P(\bar{A}) = \frac{5}{6}$$

(iii) consecutive days?



$$P(\text{Cont.}) = \frac{\text{Fav O/L}}{\text{Total O/L}}$$
$$= \frac{5}{36}$$