Answer to the question no: 1

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

Total number of trials ~~for~~ = 24

The possible values of x are the numbers 2 through 12. $x = 2$ is the event and $x = 2$....

total events are 11.

x	2	3	4	5	6	7	8	9	10
$p(x)$	$\frac{1}{24}$	$\frac{2}{24}$	$\frac{3}{24}$	$\frac{4}{24}$	$\frac{4}{24}$	$\frac{4}{24}$	$\frac{3}{24}$	$\frac{2}{24}$	$\frac{1}{24}$

The table is the probability distribution.

Answer to the question no: 2

Total number of trials for throwing a Four & a Six sided die's are 24.
[From (1)]

Therefore, the number of trials to expect a total 26 is, $46-24=22+1=23$

(1,1) (1,1) (1,1) (1,1) (1,1) (1,1) (1,1) (1,1)

(1,1) (1,1) (1,1) (1,1) (1,1) (1,1) (1,1) (1,1)

(1,1) (1,1) (1,1) (1,1) (1,1) (1,) (1,1)

=23 trials for the worst case

Ans

Answer to the question no:3

The event $(7 \geq x \geq 5)$ is the union of mutually exclusive events $X=7$, $X=6$ & $X=5$ Thus,

$$P(7 \geq x \geq 5) = P(7) + P(6) + P(5)$$

$$= \frac{4}{24} + \frac{4}{24} + \frac{4}{24}$$

$$= 0.5$$

Ans

Answer to the question no: 4

If recieving 2 from exactly one of the two die is success the the probability is,

$$\frac{9}{24} = 0.375$$

$n = 8$, $r = 3$ & $P = 0.375$

~~$^nC_r \cdot (P)^{n-r} \cdot (1$~~

$$^nC_r (1-P)^{n-r} \cdot (P)^r$$

$$= {}^8C_3 (1-0.375)^{8-3} \cdot (0.375)^3$$

$$= 56 \times 0.0954 \times 0.05273$$

$$= 0.28170$$

Ans

Answer to the question no: 5

~~We know,~~ $\cancel{E(X) = \sum_{K=-\infty}^{\infty} kP(X=K)}$

$\cancel{=}$

We know, $P(x) = E(x)/V(x)$

$E(x) =$ number of events

$V(x) =$ total number of trials $= 3$ Ans

$0.1K = E(x)/3$

$\therefore E(x) = 0.3K$ Ans

Answer to the question no.6

We know,

$$P(Y) = E(Y)/V(Y)$$

$E(Y)$ = number of events

$V(Y)$ = Total number of trials

$\therefore P(Y) = 1/3$

$= 0.333$

Therefore, the probability of Richard catching a ball thrown to him is 0.333 Ans

Answer to the question no.7

First,

3 numbers are divisable by both 7 & 9

and they are {63, 126, 189}

Second,

There are, $\frac{200}{7} - 3 = 25$ numbers that are divisable by 7 only.

Third, There are, $\frac{200}{9} - 3 = 19$ numbers that are divisable by 9 only.

Therefore, there are $25+19 = 44$ Ans numbers in the set that are divisable by either 7 or 9 but not both.

Ans

Answer to the question no: 8

First, there are $\frac{200}{3} = 66$ numbers that are divisable by 3.

Second, $\frac{200}{4} = 50$ numbers that are divisable by 4 ~~and~~

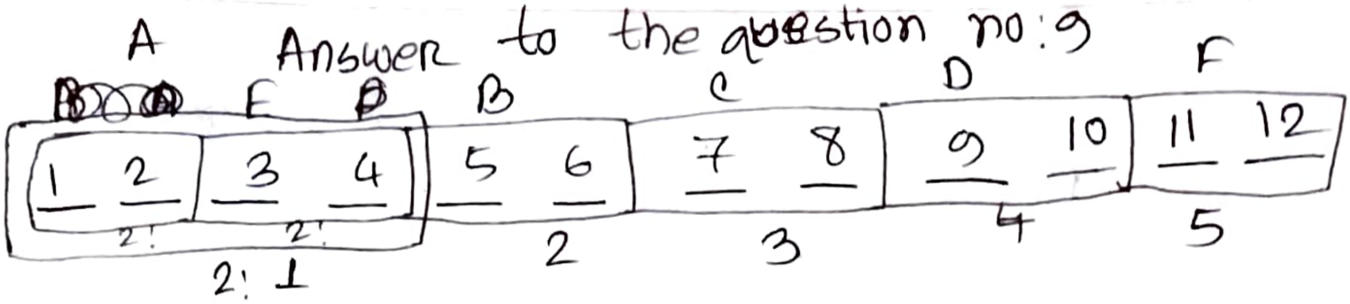
Third, $\frac{200}{12} = 16$ numbers that are divisible by 12.

Also, $66 + 50 + 16 = 116 - 16 = 100$, that are there are 100 numbers divisible by 3 or 4 or 12.

Lastly, $200 - 100 = 100$ numbers that are not divisible by 3, 4 or 12.

Ans: 100

Answer to the question no:9



$5! \times 2! \times 2! \times 2! = 192$ ways Ans

Answer to the question no:10

Given, $E(x) = 8$ Let, X be the random variable

$E(X^2) = 26$ distribution with, $a=1$,

$P(x$ $b=6$ & $n = b-a+1$

$= 6$

So, mean, $\frac{(a+b)}{2} = \frac{7}{2}$ and for the second,

$\frac{n^2-1}{12} + \frac{a+b}{4} = \frac{91}{6}$

Now, $E(X) = E(U1+U2+U3)$

$= E(U1) + E(U2) + E(U3)$

$=$

$= 21/2$

for the sum,

$$E(X) = E(X_1^2) + E(X_2^2) + E(X_3^2)$$

$$= 3 \times \frac{91}{6}$$

$$= \frac{91}{2}$$

$$= 45.5$$ Ans

Answer to the question no: 11

Brac University Building lift stops on the top & the ground floor without any call and if the lift is going up it will go up first and then recieve going down call

The probability will be $\frac{10}{11}$ Ans

as there are 10 floors below

Answer to the question no: 12

Tamim's best friend(B) wants to seat in between Tamim(T)'s other friend (O), they can seat in ABO, OBA 2 ways.

and for 8 friends there can be.

$$2 \times 6! = 1440 \text{ ways}$$

Ans

Answer to the question no: 13

Given, $P(\text{Infected}) = 8\%$

$P(\text{Not Infected}) = (100-8)\% = 92\%$

$P(\text{Positive} \,\&\, \text{Infected}) = 95\%$

$P(\text{Negative} \,\&\, \text{Infected}) = (100-95)\% = 5\%$

$P(\text{Positive} \,\&\, \text{Not infected}) = 3\%$

$P(\text{Negative} \,\&\, \text{Not infected}) = (100-3)\% = 97\%$

$$P(\text{Not Infected} \,\&\, \text{Negative}) = \frac{P(\text{Negative} \,\&\, \text{Not Infected})\,P(\text{Not Infected})}{P(\text{Negative} \,\&\, \text{Not Infected})\,P(\text{Not Infected}) + P(\text{Negative} \,\&\, \text{Infected})\,P(\text{Infected})}$$

$$= \cancel{\frac{(97 \times 92)\%}{97 \times 92 + 5 \times}}$$

$$= \left(\frac{(97 \times 92)}{(97 \times 92) + (5 \times 8)}\right)\%$$

$= 1.05\%$ Ans

Answer to the question no:14

$$\left(5x + \frac{3}{y} + \frac{4}{x} + \frac{5}{7}y\right)^8$$

$$\cancel{= {}^8C_0 (5x)^8 \cdot \left(\frac{3}{y}\right)}$$

$$= \left(5x + \frac{4}{x} + \frac{3}{y} + \frac{5y}{7}\right)^8$$

$$= \left(\frac{20x+4}{x} + \frac{21+5y^2}{7y}\right)^8$$

$$= {}^8C_0\left(\frac{20x+4}{x}\right)^8 \cdot \left(\frac{21+5y^2}{7y}\right)^0 + {}^8C_1\left(\frac{20x+4}{x}\right)^7\left(\frac{21+5y^2}{7y}\right)^1$$

$$+ {}^8C_2\left(\frac{20x+4}{x}\right)^6\left(\frac{21+5y^2}{7y}\right)^2 + {}^8C_3\left(\frac{20x+4}{x}\right)^5\left(\frac{21+5y^2}{7y}\right)^3$$

$$+ {}^8C_4\left(\frac{20x+4}{x}\right)^4\left(\frac{21+5y^2}{7y}\right)^4 + {}^8C_5\left(\frac{20x+4}{x}\right)^3\left(\frac{21+5y^2}{7y}\right)^5$$

$$+ {}^8C_6\left(\frac{20x+4}{x}\right)^2\left(\frac{21+5y^2}{7y}\right)^6 + {}^8C_7\left(\frac{20x+4}{x}\right)^1\left(\frac{21+5y^2}{7y}\right)^7$$

$$+ {}^8C_8\left(\frac{20x+4}{x}\right)^0\left(\frac{21+5y^2}{7y}\right)^8$$

$=$

Answer to the question no: 15

There are $^4C_2 = 6$ games within each of eight groups

Altogether, $6 \times 8 = 48$ games

Ans