Assignment-4

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Question: A jar contain 24 marbles, some are green and the others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue balls in the jar.

Solution:

Lets say the number of green balls be x and number of blue bays be y.

$\therefore$ we get,

$$x + y = 24 \tag{1}$$

Lets take the event of randomly drawing a green ball be E then the event of drawing a blue ball is $\overline{E}$. So,

$$P(E) + P(\overline{E}) = 1 \tag{2}$$

According to the question given,

$$P(E) = \frac{x}{x+y} = \frac{2}{3} \tag{3}$$

$$P(\overline{E}) = \frac{y}{x+y} \tag{4}$$

From (2) and (3) we get,

$$P(E) + P(\overline{E}) = 1 \tag{5}$$

$$\implies \frac{2}{3} + P(\overline{E}) = 1 \tag{6}$$

$$\implies P(\overline{E}) = 1 - \frac{2}{3} \tag{7}$$

$$\implies P(\overline{E}) = \frac{1}{3} \tag{8}$$

Now taking (1), (4) and (8)

$$P(\overline{E}) = \frac{1}{3} \tag{9}$$

$$\implies \frac{y}{x+y} = \frac{1}{3} \tag{10}$$

$$\implies \frac{y}{24} = \frac{1}{3} \tag{11}$$

$$\implies y = \frac{24 \times 1}{3} \tag{12}$$

$$\implies y = 8 \tag{13}$$

$\therefore$ the number of blue balls in the jar is 8.