Assignment 1

AI1110: Probability and Random Variables

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CBSE Probabaility Grade 10

Question 20

Question: Suppose you drop a die at random in the rectangular region as shown in the figure. what is the probability that the die will land in the circle with diameter 1m? **Solution:**

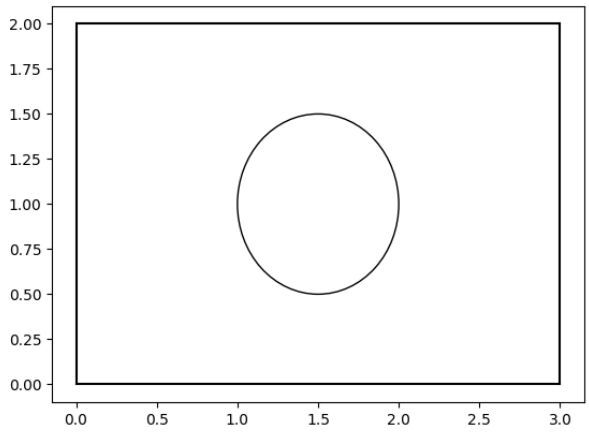

Fig. 1. Rectangular region with length $3m$ and breadth $2m$, and a circle with diameter with $1m$ in it.

Parameter	Symbol	Value
Radius Of Circle (in metre)	r	0.5
Length of rectangle(in metre)	l	3
Breadth of Rectangle(in metre)	b	2
Area of Circle	A_c, where $A_c = \pi r^2$	To be Calculated
Area of Rectangle	A_r, where $A_r = l \times b$	To be Calculated

Probability of die falling in the circle would be:

$$P = \frac{FavourableArea}{TotalArea} \tag{1}$$

$$\therefore P = \frac{AreaofCircle}{AreaofRectangle} \tag{2}$$

$$\tag{3}$$

Area of Circle $A_c = \pi \times (0.5)^2 \implies A_c = 0.785$
Area of Rectangle $A_r = l \times b \implies A_r = 6$
Hence Probability $P = \frac{0.785}{6} \implies P = 0.1308$