

# Assignment 3

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Download all python codes from

[https://github.com/Dishank422/AI1103-Probability-and-random-variables/blob/main/Assignment\\_3/codes](https://github.com/Dishank422/AI1103-Probability-and-random-variables/blob/main/Assignment_3/codes)

and latex-tikz codes from

[https://github.com/Dishank422/AI1103-Probability-and-random-variables/blob/main/Assignment\\_3/main.tex](https://github.com/Dishank422/AI1103-Probability-and-random-variables/blob/main/Assignment_3/main.tex)

In figure 0, rectangle ABCD represents sample space of  $(X, Y)$ .  $Y \leq X$  for any point  $(X, Y)$  if and only if the point lies on or below line EF. Therefore

$$\Pr(Y \leq X) = \frac{\text{Area of AEFD}}{\text{Area of ABCD}} \quad (2.0.1)$$

$$= \frac{1}{2} \quad (2.0.2)$$

## 1 PROBLEM

(Gate IN - 2021 Q.37) Consider that  $X$  and  $Y$  are independent continuous valued random variables with uniform PDF given by  $X \sim U(2, 3)$  and  $Y \sim U(1, 4)$ . Then  $\Pr(Y \leq X)$  is equal to .....

## 2 SOLUTION

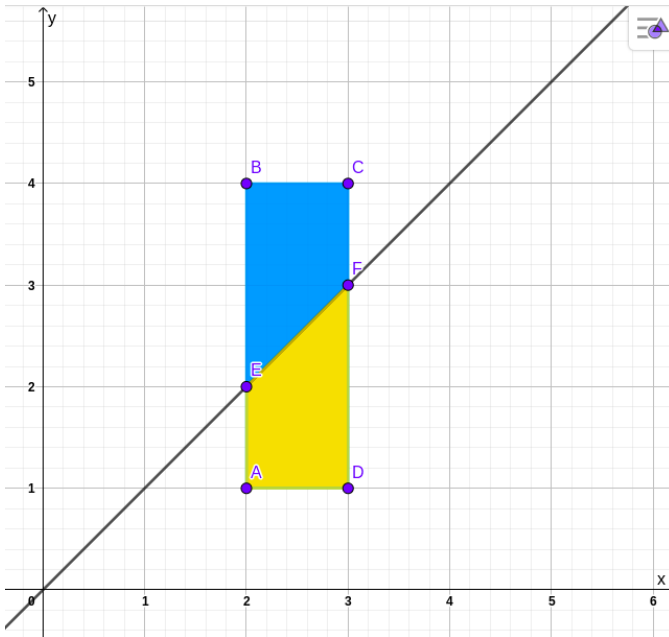


Fig. 0: Probability Distribution of  $(X, Y)$