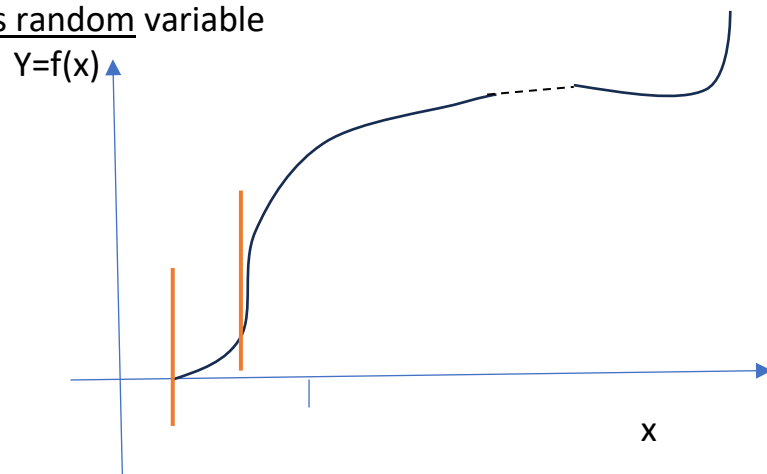


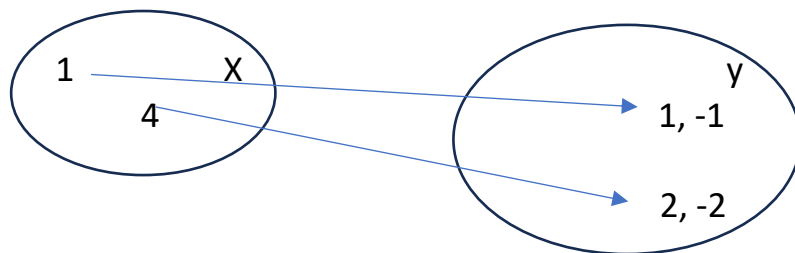
## CONTINUOUS PROBABILITY DISTRIBUTION

Let, 'x' is a continuous random variable



$$y = \frac{1}{x-2}, \quad x \in I^+$$

$y = f(x)$



### One-to-one correspondence

$Y = 2 + 3x$  .....(i) ---- A function

- 1) Relation is unique
- 2) The direction of causation:

$Y = \sqrt{x}$  ..... (ii)



S.t  $a \leq x \leq b$

The values that  $x$  can take is uncountable infinite: A Continuous Variable.  
No probability could be assigned to each value of  $x$

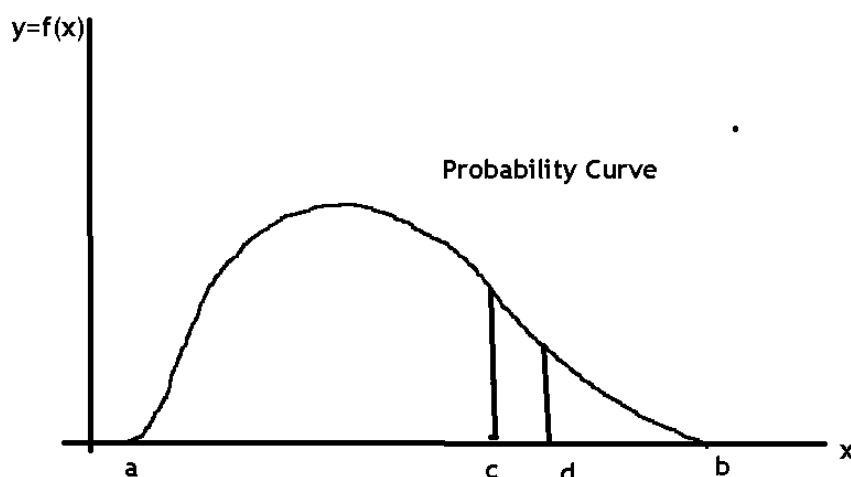
*In a continuous probability distribution, probabilities are assigned to an "interval"  $(a, b)$*

**Probability Density Function (p.d.f):** A continuous probability distribution is defined by a mathematical expression called p.d.f  $f(x)$ , specifying the range of  $x$   $(a, b)$ .

The term "**density**" in Probability Density Function reflects the fact that we are dealing with continuous random variables, and the probability is spread out over a range rather than concentrated at specific points.

**$f(x)$ : Probability Density function**

**Probability curve:** When we draw the p.d.f in a two-dimensional plane



The integral of the p.d.f represents the area under the probabilities curve

$$\int_a^b f(x) dx = 1$$

$$P(c \leq x \leq d) = \text{Area under probability curve } (c, d)$$