- mitudints

Exponential Distribution:

The p.d.f of the exponential distribution is given by

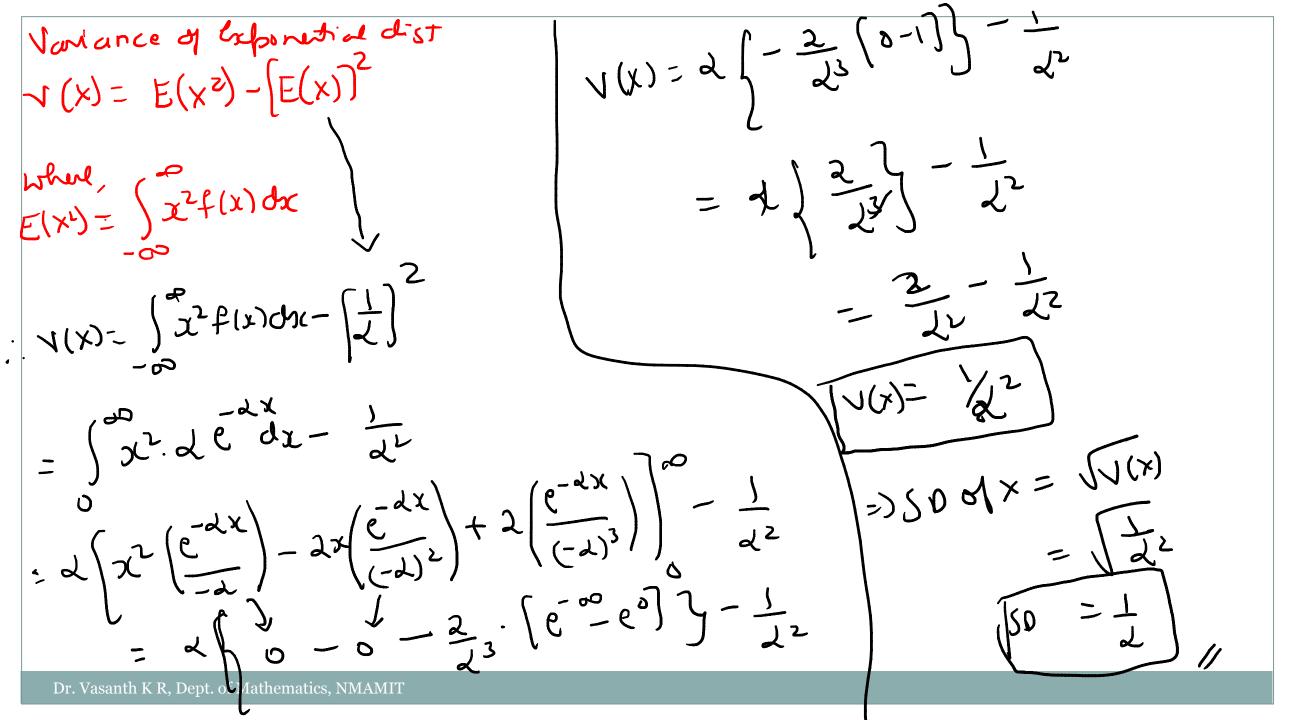
$$f(x) = \begin{cases} \alpha e^{-\alpha x}, & 0 < x < \infty \\ 0 & \text{otherwise} \end{cases}$$

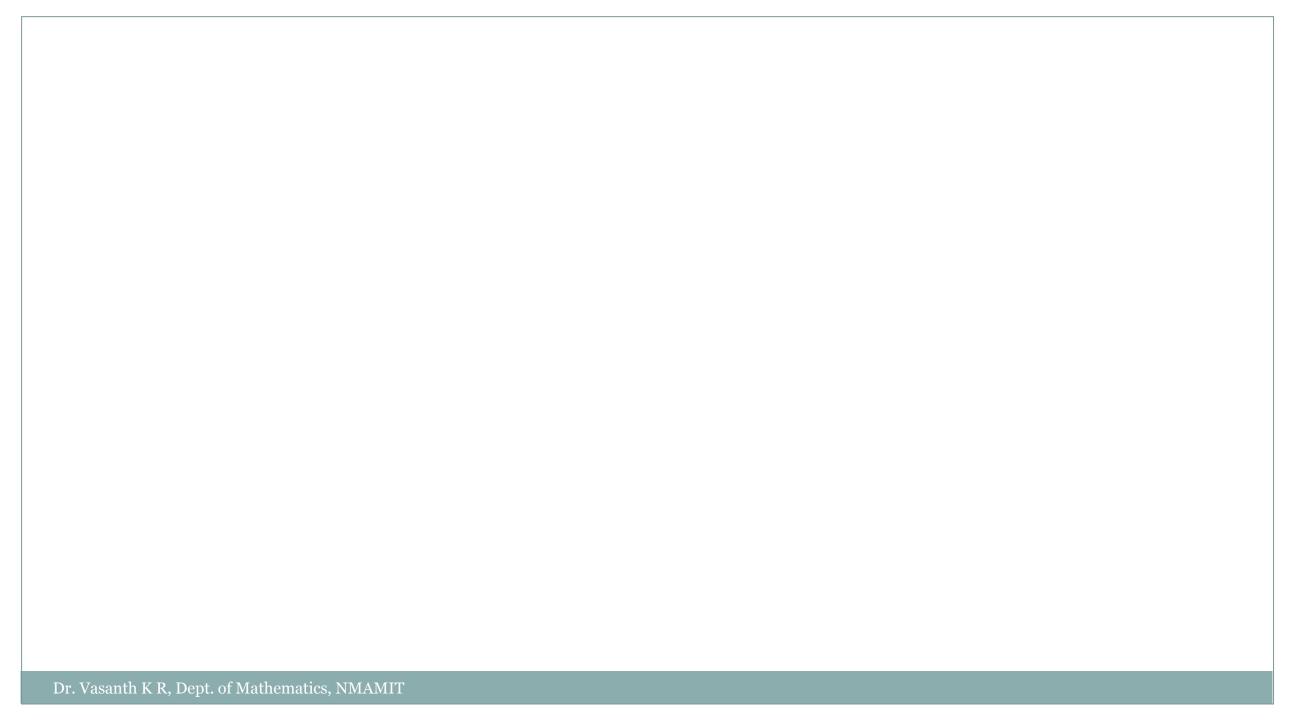
Mean and Standard Deviation of the Exponential Distribution

Mean
$$(\mu) = \frac{1}{\alpha}$$
 S.D. $(\sigma) = \frac{1}{\alpha}$ \Rightarrow $\sqrt{(\chi)} = \frac{1}{\chi}$

near E(x): Sxplastax

Jun = 1/2 = / Ja. a. Ru where $f(x) = \int de^{-dx}$; $0 \le x \le \infty$





If x is an exponential variate with mean 3 find (i)
$$P(x > 1)$$
 (ii) $P(x < 3)$

=> 2 abonutial dist is given by
$$f(x) = \int de^{-dx}$$
; $0 \le x \le \infty$

Given mean
$$\mu = 3$$

$$w + \tau = \frac{1}{\lambda}$$

$$3 = \frac{1}{\lambda} = \frac{1}{\lambda}$$

$$\frac{1}{\lambda} = \frac{1}{\lambda}$$

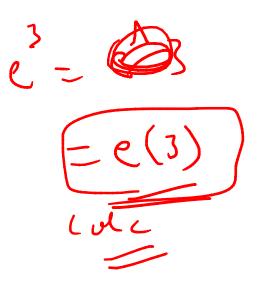
$$P(x>1) = \begin{cases} f(x) dx \\ -dx \end{cases}$$

$$= \frac{1}{3} \cdot \frac{1}{9} \cdot \frac{$$

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$$\frac{3}{5} = \frac{3}{5} f(x) dx$$

$$\frac{3}{5} \frac{1}{5} \frac{1}{5}$$



If x is an exponential variate with mean 5, evaluate.

- (i) P(0 < x < 1) (ii) $P(-\infty < x < 10)$
- (iii) $P(x \le 0 \text{ or } x \ge 1)$

) (fersola

- Am: P(02X21) =0-1813
- y findr
- 1) p(-0 <2<10) = 0.8647
- J) P(XEO Q X51) = 0.8187

The length of telephone conversation in a booth has been an exponential distribution and found on an average to be 5 minutes. Find the probability that a random call made from this booth (i) ends less than 5 minutes (ii) between 5 and 10 minutes.

Given mean
$$M = S$$
: $f(x) = \int de^{-dx} 0 \le x \le \infty$

$$= \int de^{-1} x = \int de$$

1)
$$P(x < 5) = \int_{0.6231/1}^{5} f(x) dx$$

= $\int_{0.6231/1}^{5} f(x) dx$

$$= \int_{0.2325}^{0} P(54 \times 210) = \int_{0.2325}^{0} P(8) dx$$

$$= 0.2325$$

The sales per day in a shop is exponentially distributed with the average sale amounting to Rs.100 and net profit is 8%. Find the probability that the net profit exceeds Rs. 30 on two consecutive days.

P(A) 375) =
$$\begin{cases} f(x) dx \\ -0.01 & dx \end{cases}$$

P(A) 375) = $\begin{cases} f(x) dx \\ -0.01 & dx \end{cases}$

$$P(A > 375) = \begin{cases} 0.01 e^{0.01 \times 2} dx \\ 0.01 e^{-0.01 \times 2} dx$$

$$= -(0.01 \times 375)$$

The Prob that the not Profit exceeds K_{130} for L_{130} (one ecutive days is $0.0235 \times 2 =)$? or $0.0235 \times 0.0235 =)$.

In a certain town the duration of a shower is exponentially distributed with mean 5 minutes. What is the probability that a shower will last for:

(i) 10 minutes or more (ii) less than 10 minutes (iii) between 10 and 12 minutes

$$|x| = 5$$

$$|x| = 5$$