- 3.1 Discrete Uniform Distribution

  P(x) = 1/N

  $$\mu = E(X) = \frac{b+a}{2}$$

  $$\sigma^2 = \frac{(b-a+1)^2 - 1}{12}$$

  Ex:

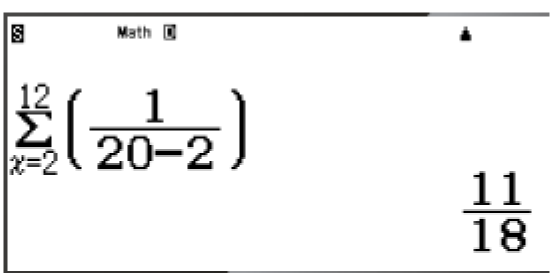
  4) Let X be a discrete uniform random variable on the interval [2; 20].

  a) Find P(X <13).

  b) Find the mean and standard deviation of X.

  A) 0 & 30 B) 11 & 30 C) 11 & 5.477 D) None of the others

  P(X<13):



- 3.2 Binomial Distribution

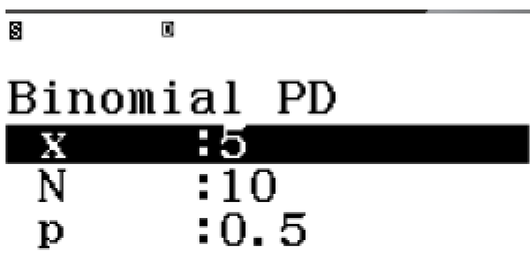
  P(x) = 

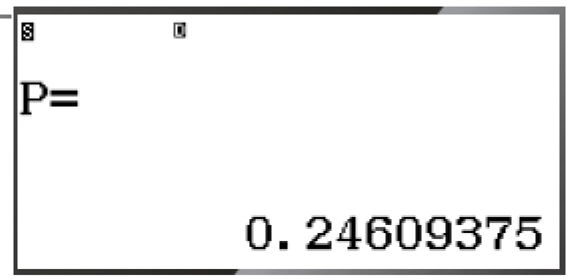
  Ex:

9. The random variable X has a binomial distribution with n = 10 and p = 0.5. Determine the following probabilities:

9.1 $P(X=5)$ 7.2 $P(X\le 2)$ 7.3 $P(X>7)$

9.1.





E(x) = np

V(x) = np(1-p)

- 3.3 Geometric Distribution

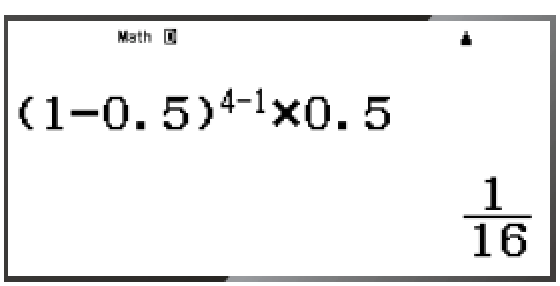
P = ((1-p)^(x-1))*p

Ex:

13. Suppose that the random variable X has a geometric distribution with p = 0 5.

13.1 Determine the following probabilities: $P(X=4)$, $P(X=5)$, $P(X>3)$

P(X = 4):



E(x) = 1/p

V(x) = (1-p)/p^2

- 3.4 Negative Binomial Distribution

$$f(x) = \binom{x-1}{r-1}(1-p)^{x-r}p^r$$

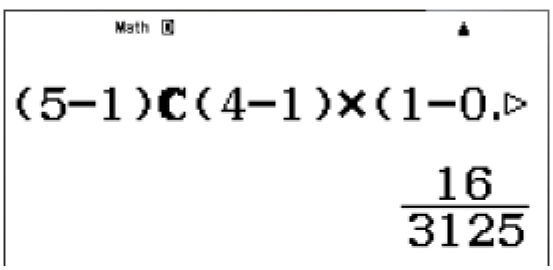
$$\mu = E(X) = r/p \quad \text{and} \quad \sigma^2 = V(X) = r(1-p)/p^2$$

Ex:

14. Suppose that X is a negative binomial random variable with p = 0.2 and r = 4. Determine the following:

14.1 $E(X)$ and $V(X)$ 14.2 $P(X=3)$ and $P(X=5)$ 14.3 $P(X>5)$

P(X = 5):



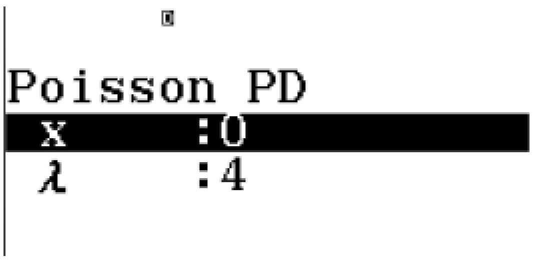
- 3.5 Poisson Distribution

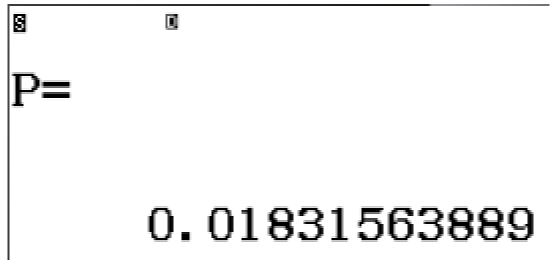
P(x) = 

21. Suppose that X has a Poisson distribution with a mean of 4. Determine the following probabilities:

21.1 $P(X=0)$ and $P(X=4)$ 21.2 $P(3 \le X \le 5)$ and $P(X>3)$

P(X=0):





- 3.6 Hypergeometric

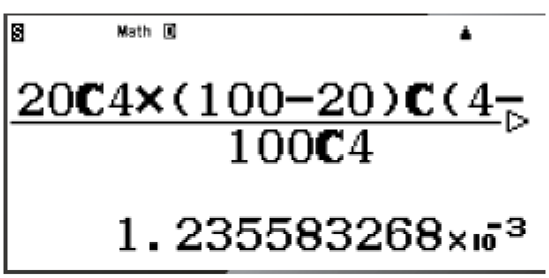
$$f(x) = \frac{\binom{K}{x}\binom{N-K}{n-x}}{\binom{N}{n}}$$

$$\mu = E(X) = np \qquad \text{and} \qquad \sigma^2 = V(X) = np(1-p)\left(\frac{N-n}{N-1}\right)$$

16. Suppose that X has a hypergeometric distribution with $N = 100, n = 4$ and $K = 20$. Determine the following:

16.1 $P(X = 4)$ and $P(X = 6)$

P(X=4):



- 4.1 Basic

+Probability Density Function: f(x)

+Cumulative Distribution Functions: F(x) = ∫f(x)

+Mean and variance:

- 4.2 Continuous Uniform RV

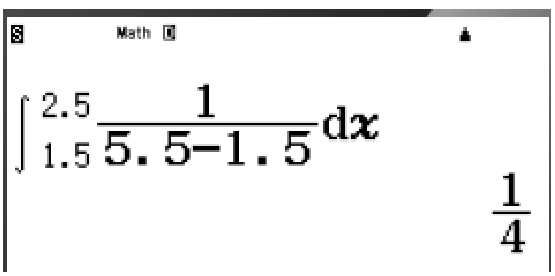
$$f(x) = 1/(b-a), \qquad a \leq x \leq b$$

$$\mu = E(X) = \frac{(a+b)}{2} \quad \text{and} \quad \sigma^2 = V(X) = \frac{(b-a)^2}{12}$$

4. Suppose that X has a continuous uniform distribution over the interval $[1.5;5.5]$. Determine the following:

4.1Mean, variance, and standard deviation of X   4.2 $P(X<2.5)$

P(X<2.5):



- 4.3 Standard Normal Distribution

$$Z = \frac{X-\mu}{\sigma}$$

B1: 

B2:P(Z<z): 

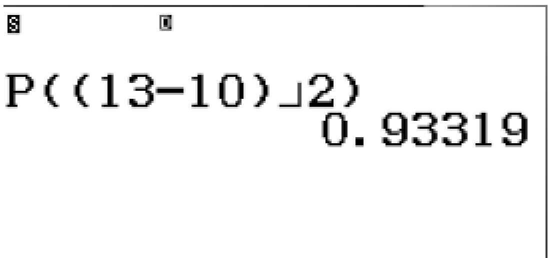
Ex:

8. Assume that X is normally distributed with a mean of 10 and a standard deviation of 2. Determine the following:

8.1 $P(X<13)$ and $P(X>9)$

8.2 $P(6<X<14)$ and $P(-2<X<8)$

P(X<13):



- 4.4 Exponential Distribution

$$f(x) = \lambda e^{-\lambda x}$$

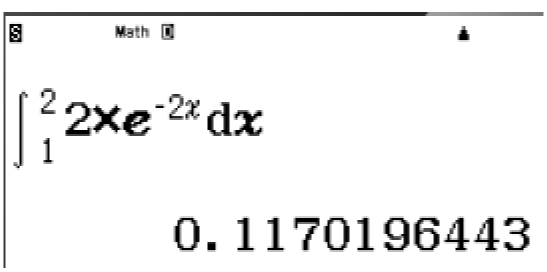
Ex:

16. Suppose that X has an exponential distribution with $\lambda = 2$. Determine the following:

16.1 $P(X \leq 0)$ and $P(X \geq 2)$

16.2 $P(X \leq 1)$ and $P(1<X<2)$

P(1<X<2):



- 7.1 Central Limit Theorem

$$Z = \frac{\overline{X} - \mu}{\sigma / \sqrt{n}}$$

B1: MENU 6 1 AC (vào mode thống kê để tính xác xuất phân phối chuẩn)

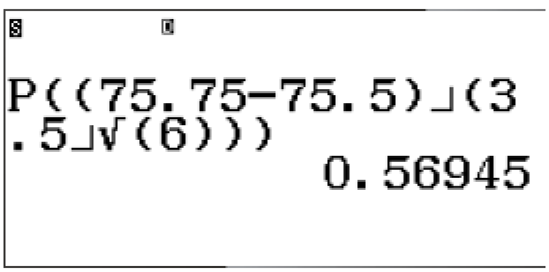
B2:P(Z<z): OPTN ▽ 4 1

Ex:

2. A synthetic fiber used in manufacturing carpet has tensile strength that is normally distributed with mean 75.5 psi and standard deviation 3.5 psi.

2.1 Find the probability that a random sample of n = 6 fiber specimens will have sample mean tensile strength that exceeds 75.75 psi.

2.1



- 11. Simple Linear Regression and Correlation

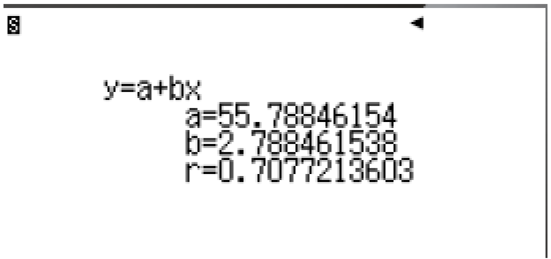
1.2

Cost	9	2	3	4	2	5	9	10
Number	85	52	55	68	67	86	83	73

B1: MENU 6 2 : để nhập dữ liệu

B2:

+Simple linear regression line: y = a+bx: OPTN 3



+2-variable calculation: