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## ■ Normal Probability Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

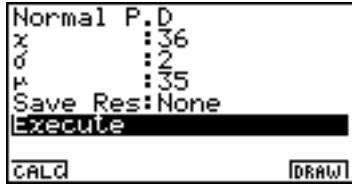
- 2. **F5** (DIST) **T** (Norm) **T** (P.D)... Normal Probability Density
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]
  - F1** (CALC) ... Performs calculation.
  - F6** (DRAW) ... Draws graph.



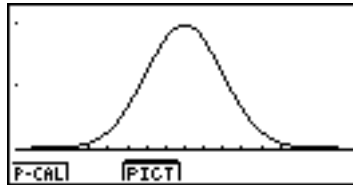
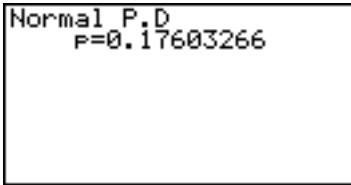
**Example** Calculate probability density  $p$  when the random variable for normal distribution  $N(35, 2^2)$  is 36.

**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **1** (Norm) **1** (P.D)
- ③ **3** **6** **EXE**  
**2** **EXE**  
**3** **5** **EXE**  
**F1** (None) ▼
- ④ **F1** (CALC)

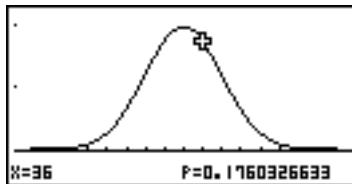
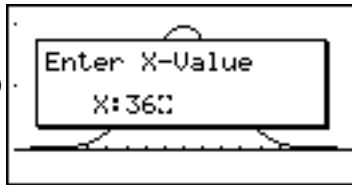


**Result Screen**



Result:  $p = 0.176$

- ⑤ **ESC**  
**F6** (DRAW)  
 (Pressing **F6** (DRAW) draws the graph.)
- ⑥ **F1** (P-CAL)  
**3** **6** **EXE**  
 Enter the X-coordinate.



The **+** part on the graph indicates the location of the displayed coordinates  $(x, p)$ .

---

## ■ Normal Distribution Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

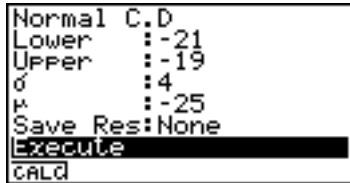
- 2. **F5** (DIST) **F1** (Norm) **F2** (C.D)... Normal Distribution Probability
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]  
**F1** (CALC) ... Performs calculation.



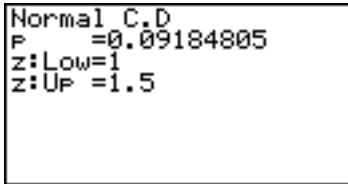
**Example** Given that  $x$  is normal distribution with  $\mu = -25$  and  $\sigma = 4$ , find  $\Pr(-21 \leq x \leq -19)$ .

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **1**(Norm) **2**(C.D)
- ③ **(←)** **2** **1** **EXE**  
**(←)** **1** **9** **EXE**  
**4** **EXE**  
**(←)** **2** **5** **EXE**  
**F1**(None) **▼**
- ④ **F1**(CALC)



**Result Screen**



Result:  $p = 0.092$

---

## ■ Inverse Cumulative Normal Distribution

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. **F5** (DIST) **F1** (Norm) **F3** (Invrse)... Inverse Cumulative Normal Distribution
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]  
**F1** (CALC) ... Performs calculation.



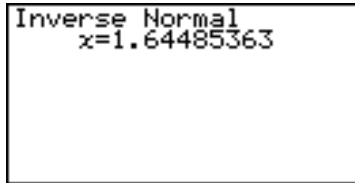
**Example** Find  $z$  so that 5% of the area under the standard normal distribution curve lies to the right of  $z$ .

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **1**(Norm) **3**(Invrse)
- ③ **F2**(RIGHT) **▼**  
  - 0** **5** **EXE**
  - 1** **EXE**
  - 0** **EXE**
  - F1**(None) **▼**
- ④ **F1**(CALC)



**Result Screen**



Result:  $x = 1.645$

---

## ■ Student- $t$ Probability Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

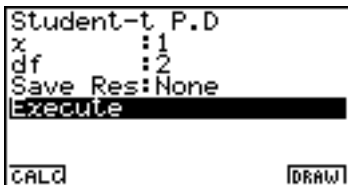
- 2. **F5** (DIST) **F2** (T) **F1** (P.D)... Student- $t$  Probability Density
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]
  - F1** (CALC) ... Performs calculation.
  - F6** (DRAW) ... Draws graph.



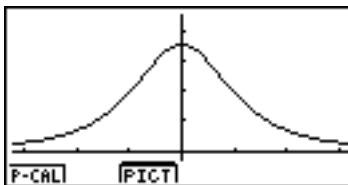
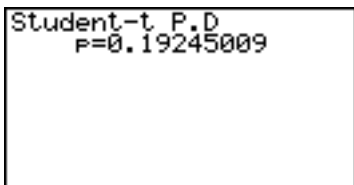
**Example** Calculate probability density  $p$  when random variable  $x$  is 1 for a t-distribution with degrees of freedom is 2.

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **2**(T) **1**(P.D)
- ③ **1** **EXE**  
**2** **EXE**  
**F1**(None)  $\blacktriangledown$
- ④ **F1**(CALC)

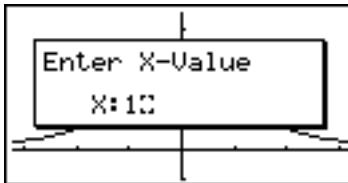


**Result Screen**



Result:  $p = 0.192$

- ⑤ **ESC**  
**F6**(DRAW)  
 (Pressing **F6**(DRAW) draws the graph.)



- ⑥ **F1**(P-CAL)  
**1** **EXE**  
 Enter the X-coordinate.



The  $\oplus$  part on the graph indicates the location of the displayed coordinates ( $x$ ,  $p$ ).

---

## ■ Student- $t$ Distribution Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. **F5**(DIST) **F2**(T) **F2**(C.D)... Student- $t$  Distribution Probability
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]  
**F1**(CALC) ... Performs calculation.



**Example** Find point  $t$  when the right side probability is 0.05 for a  $t$ -distribution with degrees of freedom is 15.

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **2**(T) **2**(C.D)
- ③ **1** **.** **7** **EXE**  
**1** **EXP** **9** **9** **EXE**  
**1** **5** **EXE**  
**F1**(None) **▼**

```
Student-t C.D
Lower :1.7
Upper :1E+99
df :15
Save Res:None
Execute
CALC
```

- ④ **F1**(CALC)

$1.7 < t$

```
Student-t C.D
P =0.0548831
t:Low=1.7
t:UP =1E+99
```

- ESC**
- ▲** **▲** **▲** **▲** **1** **.** **8** **EXE**
- ▼** **▼** **▼**
- F1**(CALC)

$1.7 < t < 1.8$

```
Student-t C.D
P =0.04600105
t:Low=1.8
t:UP =1E+99
```

- ESC**
- ▲** **▲** **▲** **▲** **1** **.** **7** **5** **EXE**
- ▼** **▼** **▼**
- F1**(CALC)

$1.75 < t < 1.80$

```
Student-t C.D
P =0.05027008
t:Low=1.75
t:UP =1E+99
```

- ESC**
- ▲** **▲** **▲** **▲** **1** **.** **7** **6** **EXE**
- ▼** **▼** **▼**
- F1**(CALC)

$1.75 < t < 1.76$

```
Student-t C.D
P =0.0493894
t:Low=1.76
t:UP =1E+99
```

- ESC**
- ▲** **▲** **▲** **▲** **1** **.** **7** **5** **3** **EXE**
- ▼** **▼** **▼**
- F1**(CALC)

⋮

A trial-and-error process is repeated until an appropriate value is found.

**Result Screen**

```
Student-t C.D
P =0.05000444
t:Low=1.753
t:UP =1E+99
```

Result :  $t = 1.753$

---

## ■ $\chi^2$ Probability Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

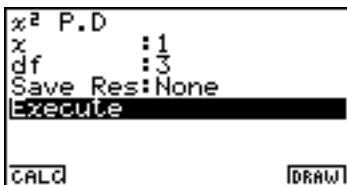
- 2. **F5** (DIST) **F3** ( $\chi^2$ ) **F1** (P.D)...  $\chi^2$  Probability Density
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]
  - F1** (CALC) ... Performs calculation.
  - F6** (DRAW) ... Draws graph.



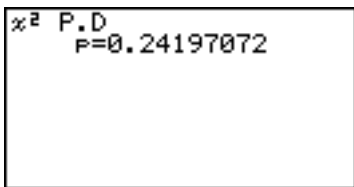
**Example** Calculate probability density  $p$  when random variable  $x$  is 1 for a  $\chi^2$ -distribution with degrees of freedom is 3.

**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **3** ( $\chi^2$ ) **1** (P.D)
- ③ **1** **EXE**  
**3** **EXE**  
**F1** (None)  $\blacktriangledown$
- ④ **F1** (CALC)

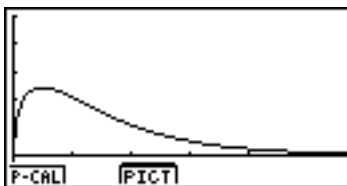


**Result Screen**

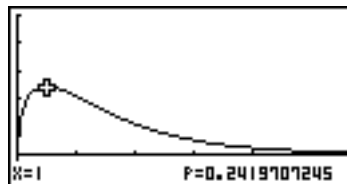
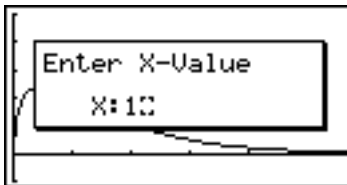


Result:  $p = 0.242$

- ⑤ **ESC**  
**F6** (DRAW)  
 (Pressing **F6** (DRAW) draws the graph.)



- ⑥ **F1** (P-CAL)  
**1** **EXE**  
 Enter the X-coordinate.



The  $\oplus$  part on the graph indicates the location of the displayed coordinates  $(x, p)$ .

---

## ■ $\chi^2$ Distribution Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. **[F5]** (DIST) **[3]** ( $\chi^2$ ) **[2]** (C.D)...  $\chi^2$  Distribution Probability
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]  
**[F1]** (CALC) ... Performs calculation.

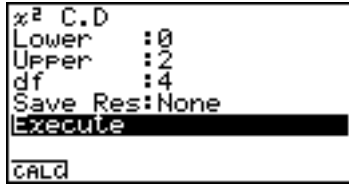


**Example** Calculate the probability of a  $\chi^2$  distribution when the degrees of freedom is 4 and the upper limit is  $\chi^2 = 2$ .

---

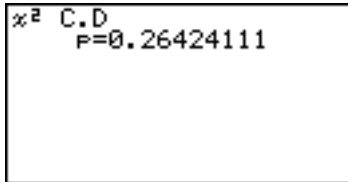
**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **3** ( $\chi^2$ ) **2** (C.D)
- ③ **0** **EXE**  
**2** **EXE**  
**4** **EXE**  
**F1** (None)  $\blacktriangledown$
- ④ **F1** (CALC)



---

**Result Screen**



Result :  $p = 0.264$

---

## ■ *F* Probability Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

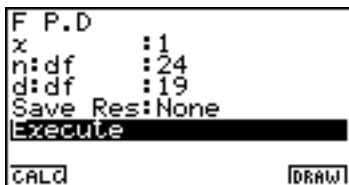
- 2. **F5** (DIST) **4** (F) **1** (P.D)... *F* Probability Density
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]
  - F1** (CALC) ... Performs calculation.
  - F6** (DRAW) ... Draws graph.



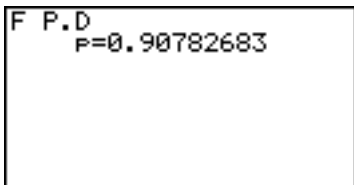
**Example** Calculate probability density  $p$  when random variable  $x$  is 1 for an  $F$ -distribution with numerator degrees of freedom is 24 and denominator degrees of freedom is 19.

**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **4** (F) **1** (P.D)
- ③ **1** **EXE**
  - 2** **4** **EXE**
  - 1** **9** **EXE**
  - F1** (None)  $\nabla$
- ④ **F1** (CALC)

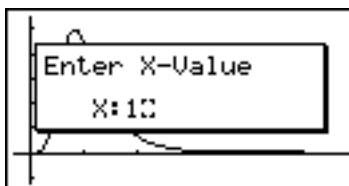


**Result Screen**

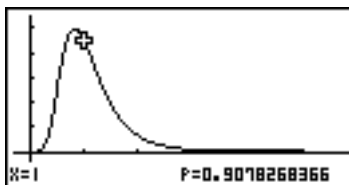


Result:  $p = 0.908$

- ⑤ **ESC**
    - F6** (DRAW)
- (Pressing **F6** (DRAW) draws the graph.)



- ⑥ **F1** (P-CAL)
    - 1** **EXE**
- Enter the X-coordinate.



The  $\oplus$  part on the graph indicates the location of the displayed coordinates ( $x$ ,  $p$ ).

---

## ■ *F* Distribution Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

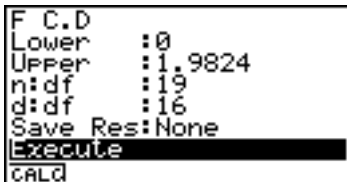
- 2. **[F5]** (DIST) **[4]** (F) **[2]** (C.D)... *F* Distribution Probability
- 3. Set calculation parameters.
- 4. Align the cursor with [Execute]  
**[F1]** (CALC) ... Performs calculation.



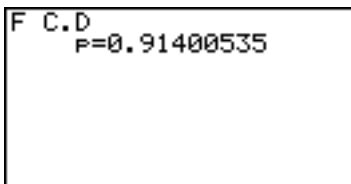
**Example** Calculate the probability of  $F$  distribution when the lower limit is 0, the upper limit is 1.9824,  $n:df = 19$ , and  $d:df = 16$ .

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **4**(F) **2**(C.D)
- ③ **0** **EXE**  
**1** **.** **9** **8** **2** **4** **EXE**  
**1** **9** **EXE**  
**1** **6** **EXE**  
**F1**(None) ▼
- ④ **F1**(CALC)



**Result Screen**



Result :  $p = 0.914$

---

## ■ Binomial Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **2ND** (DIST) **5** (Binmal) **1** (P.D)... Binomial Probability
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1** (CALC) ... Performs calculation.



**Example** 20 white marbles and 30 red marbles are placed into a container. One marble is taken out of and then replaced into the container, and then another marble is removed. Calculate the probability of a white marble being picked 0, 1, and 2 times.

**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **5**(Binmal) **1**(P.D)
- ③ **F2**(VAR) **▼**
  - 0** **EXE**
  - 2** **EXE**
  - 4** **EXE**
  - F1**(None) **▼**
- ④ **F1**(CALC)

```
Binomial P.D
Data :Variable
x :0
Numtrial:2
P :0.4
Save Res:None
Execute
CALC
```

- ESC**
- ▼ ▼**
- 1** **EXE**
- ▼ ▼ ▼**
- F1**(CALC)

```
Binomial P.D
Data :Variable
x :1
Numtrial:2
P :0.4
Save Res:None
Execute
```

- ESC**
- ▼ ▼**
- 2** **EXE**
- ▼ ▼ ▼**
- F1**(CALC)

```
Binomial P.D
Data :Variable
x :2
Numtrial:2
P :0.4
Save Res:None
Execute
```

**Result Screen**

Results:  $p = 0.36$  when  $x = 0$ ;  $p = 0.48$  when  $x = 1$ ;  $p = 0.16$  when  $x = 2$

$x = 0$

```
Binomial P.D
P=0.36
```

$x = 1$

```
Binomial P.D
P=0.48
```

$x = 2$

```
Binomial P.D
P=0.16
```

---

## ■ Binomial Cumulative Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **F5** (DIST) **F5** (Binmal) **F2** (C.D) ... Binomial Cumulative Density
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1** (CALC) ... Performs calculation.

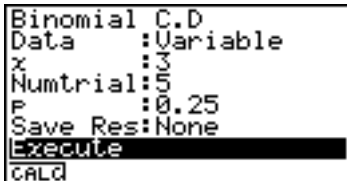


**Example** George is taking a multiple-choice examination that consists of five questions . Each question has four possible answers. George guesses at every answer. What is the probability that he can only answer three questions or less?

---

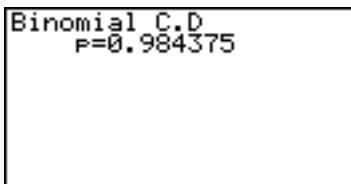
**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **F5** (Binmal) **F2** (C.D)
- ③ **F2** (VAR) ▼
  - 3** **EXE**
  - 5** **EXE**
  - **2** **5** **EXE**
  - F1** (None) ▼
- ④ **F1** (CALC)



---

**Result Screen**



Result :  $p = 0.984$

---

## ■ Poisson Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

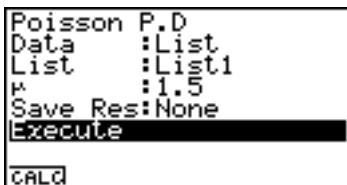
- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **F5**(DIST) **F6**(Poisn) **F1**(P.D) ... Poisson Probability
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1**(CALC) ... Performs calculation.



**Example** The probability of scratches occurring in the wire during a certain wire drawing process is 0.1 per meter. This means that you can expect 1.5 scratches for every 15 meters of wire. Calculate the possibilities of 0, 1, and 2 scratches occurring.

**Procedure**

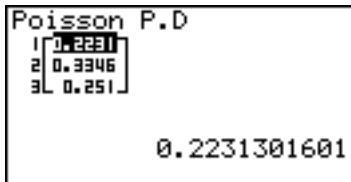
- ① **MENU** STAT2
- ② **0** **EXE**
- 1** **EXE**
- 2** **EXE**
- ③ **F5** (DIST) **6** (Poisn) **1** (P.D)
- ④ **F1** (LIST) **▼**
- F1** (LIST) **1** **EXE** **▼**
- 1** **◦** **5** **EXE**
- F1** (None) **▼**
- ⑤ **F1** (CALC)



**Result Screen**

Result:

- $\mu = 0$   $p = 0.223$
- $\mu = 1$   $p = 0.335$
- $\mu = 2$   $p = 0.251$



---

## ■ Poisson Cumulative Density

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **F5**(DIST) **F6**(Poisn) **F2**(C.D) ... Poisson Cumulative Density
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1**(CALC) ... Performs calculation.

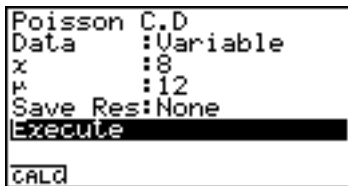


**Example** The average number of trucks arriving on any one day at a truck depot in a certain city is known to be 12. What is a probability that on a given day fewer than 9 trucks will arrive at this depot?

---

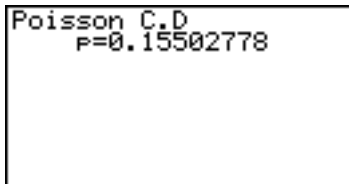
**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **6** (Poisn) **2** (C.D)
- ③ **F2** (VAR) ▼
  - 8** **EXE**
  - 1** **2** **EXE**
  - F1** (None) ▼
- ④ **F1** (CALC)



---

**Result Screen**



Result :  $p = 0.155$

---

## ■ Geometric Probability

---

### Set Up

- 1. On the icon menu, select STAT2.

### Execution

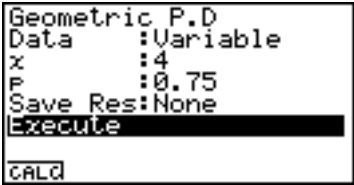
- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **2ND**(DIST) **7**(Geo) **1**(P.D) ... Geometric Probability
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1**(CALC) ... Performs calculation.



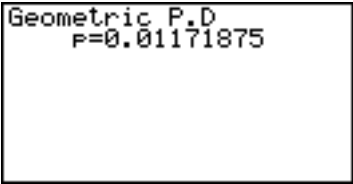
**Example** If the probability is 75% that an applicant for a driver's licence will pass the road test on any given try. What is the probability that an applicant will finally pass the test on the 4th try?

**Procedure**

- ① **MENU** STAT2
- ② **F5** (DIST) **7** (Geo) **1** (P.D)
- ③ **F2** (VAR) **4** **EXE**
- ④ **F1** (None) **7** **5** **EXE**
- ⑤ **F1** (None) **7** **5** **EXE**
- ⑥ **F1** (None) **7** **5** **EXE**
- ⑦ **F1** (None) **7** **5** **EXE**
- ⑧ **F1** (None) **7** **5** **EXE**
- ⑨ **F1** (None) **7** **5** **EXE**
- ⑩ **F1** (None) **7** **5** **EXE**
- ⑪ **F1** (None) **7** **5** **EXE**
- ⑫ **F1** (None) **7** **5** **EXE**
- ⑬ **F1** (None) **7** **5** **EXE**
- ⑭ **F1** (None) **7** **5** **EXE**
- ⑮ **F1** (None) **7** **5** **EXE**
- ⑯ **F1** (None) **7** **5** **EXE**
- ⑰ **F1** (None) **7** **5** **EXE**
- ⑱ **F1** (None) **7** **5** **EXE**
- ⑲ **F1** (None) **7** **5** **EXE**
- ⑳ **F1** (None) **7** **5** **EXE**
- ㉑ **F1** (None) **7** **5** **EXE**
- ㉒ **F1** (None) **7** **5** **EXE**
- ㉓ **F1** (None) **7** **5** **EXE**
- ㉔ **F1** (None) **7** **5** **EXE**
- ㉕ **F1** (None) **7** **5** **EXE**
- ㉖ **F1** (None) **7** **5** **EXE**
- ㉗ **F1** (None) **7** **5** **EXE**
- ㉘ **F1** (None) **7** **5** **EXE**
- ㉙ **F1** (None) **7** **5** **EXE**
- ㉚ **F1** (None) **7** **5** **EXE**
- ㉛ **F1** (None) **7** **5** **EXE**
- ㉜ **F1** (None) **7** **5** **EXE**
- ㉝ **F1** (None) **7** **5** **EXE**
- ㉞ **F1** (None) **7** **5** **EXE**
- ㉟ **F1** (None) **7** **5** **EXE**
- ㊱ **F1** (None) **7** **5** **EXE**
- ㊲ **F1** (None) **7** **5** **EXE**
- ㊳ **F1** (None) **7** **5** **EXE**
- ㊴ **F1** (None) **7** **5** **EXE**
- ㊵ **F1** (None) **7** **5** **EXE**
- ㊶ **F1** (None) **7** **5** **EXE**
- ㊷ **F1** (None) **7** **5** **EXE**
- ㊸ **F1** (None) **7** **5** **EXE**
- ㊹ **F1** (None) **7** **5** **EXE**
- ㊺ **F1** (None) **7** **5** **EXE**
- ㊻ **F1** (None) **7** **5** **EXE**
- ㊼ **F1** (None) **7** **5** **EXE**
- ㊽ **F1** (None) **7** **5** **EXE**
- ㊾ **F1** (None) **7** **5** **EXE**
- ㊿ **F1** (None) **7** **5** **EXE**



**Result Screen**



Result :  $p = 0.012$

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## ■ Geometric Cumulative Density

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### Set Up

- 1. On the icon menu, select STAT2.

### Execution

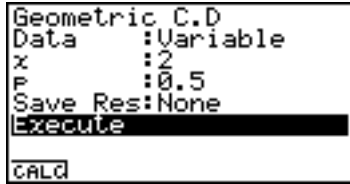
- 2. When using list data (List is selected as the Data parameter) , be sure to input data into the list first.
- 3. **F5**(DIST) **F7**(Geo) **F2**(C.D) ... Geometric Cumulative Density
- 4. Set calculation parameters.
- 5. Align the cursor with [Execute]  
**F1**(CALC) ... Performs calculation.



**Example** Calculate the geometric cumulative probability for  $x = 2, 3, 4$  when  $p = 0.5$ .

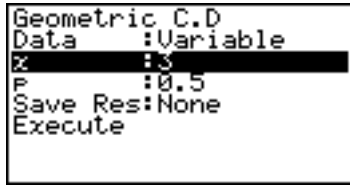
**Procedure**

- ① **MENU** STAT2
- ② **F5**(DIST) **7**(Geo) **2**(C.D)
- ③ **F2**(VAR) **▼**
  - 2** **EXE**
  - **5** **EXE**
  - F1**(None) **▼**

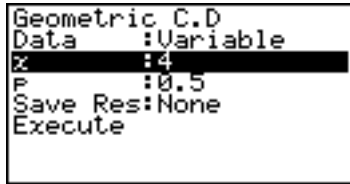


- ④ **F1**(CALC)

- ESC**
- ▲** **▲** **▲**
- 3** **EXE**
- ▼** **▼**
- F1**(CALC)



- ESC**
- ▲** **▲** **▲**
- 4** **EXE**
- ▼** **▼**
- F1**(CALC)



**Result Screen**

Results:  $p = 0.75$  when  $x = 2$ ;  $p = 0.875$  when  $x = 3$ ;  $p = 0.9375$  when  $x = 4$

