■ Normal Probability Density

Set Up

1. On the icon menu, select STAT2.

Execution

2. F5(DIST) 1(Norm) 1(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.**

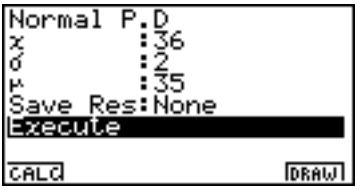
Procedure

① [MENU] STAT2

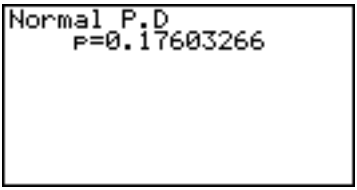
② [F5](DIST) [1](Norm) [1](P.D)

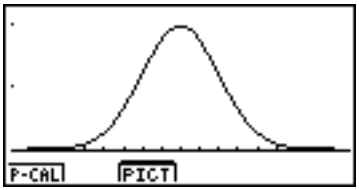
③ [3] [6] [EXE]
[2] [EXE]
[3] [5] [EXE]
[F1](None)[▼]

④ [F1](CALC)



Result Screen

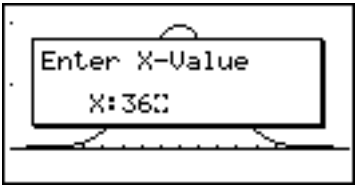


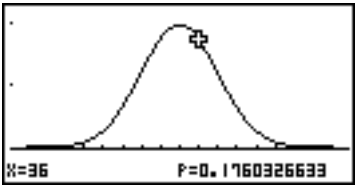


Result: p = 0.176

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) 1(Norm) 2(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 ($-21 \leqq x \leqq -19$).**

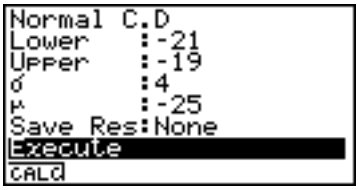
Procedure

① MENU STAT2

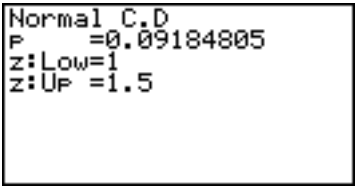
② F5(DIST) 1(Norm) 2(C.D)

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) 1(Norm) 3(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.**

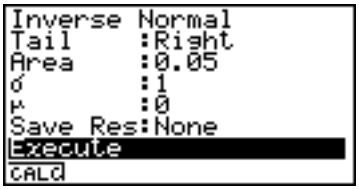
Procedure

① MENU STAT2

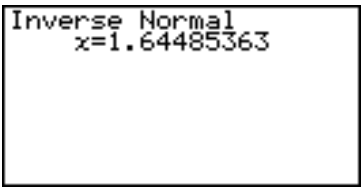
② F5(DIST) 1(Norm) 3(Invrse)

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) 2(T) 1(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.**

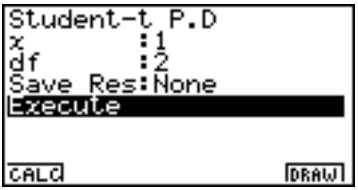
Procedure

① MENU STAT2

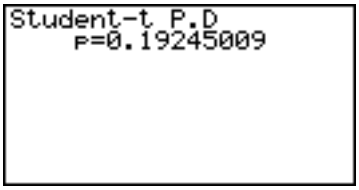
② F5(DIST) 2(T) 1(P.D)

③ 1 EXE
2 EXE
F1(None) ▼

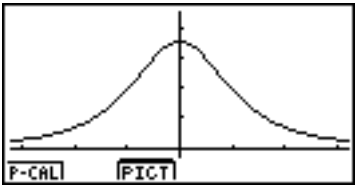
④ F1(CALC)



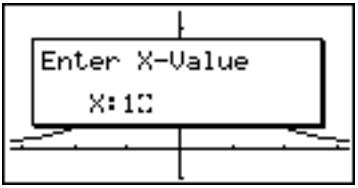
Result Screen



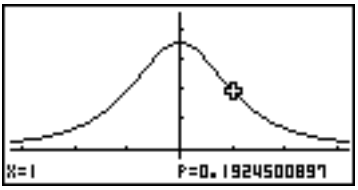
Result: p = 0.192



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



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



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

● ● ● ● ●

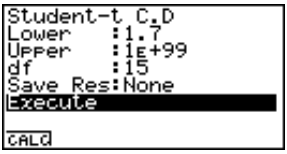
Example **Find point t when the right side probability is 0.05 for a *t*-distribution with degrees of freedom is 15.**

Procedure

① [MENU] STAT2

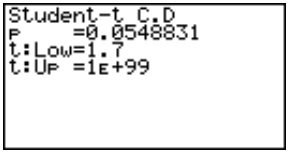
② [F5](DIST)[2](T)[2](C.D)

③ [1][•][7][EXE]
[1][EXP][9][9][EXE]
[1][5][EXE]
[F1](None)[▼]



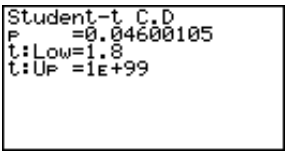
④ [F1](CALC)

1.7 < *t*



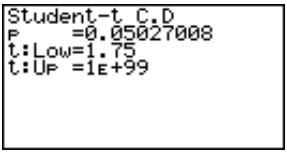
[ESC]
[▲][▲][▲][▲][1][•][8][EXE]
[▼][▼][▼]
[F1](CALC)

1.7 < *t* < 1.8



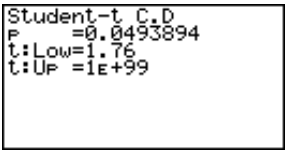
[ESC]
[▲][▲][▲][▲][1][•][7][5][EXE]
[▼][▼][▼]
[F1](CALC)

1.75 < *t* < 1.80



[ESC]
[▲][▲][▲][▲][1][•][7][6][EXE]
[▼][▼][▼]
[F1](CALC)

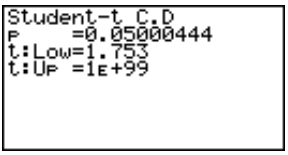
1.75 < *t* < 1.76



[ESC]
[▲][▲][▲][▲][1][•][7][5][3][EXE]
[▼][▼][▼]
[F1](CALC)
⋮

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

Result Screen



Result : t =1.753

■ χ^2 Probability Density

Set Up

1. On the icon menu, select STAT2.

Execution

2. F5(DIST) 3(χ^2) 1(P.D)... χ^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 χ^2-distribution with degrees of freedom is 3.**

Procedure

① MENU STAT2

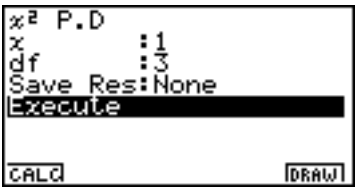
② F5(DIST) 3(χ^2) 1(P.D)

③ 1 EXE

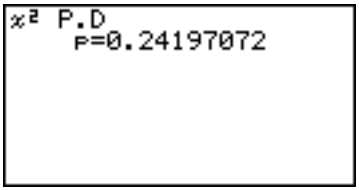
3 EXE

F1(None) ▼

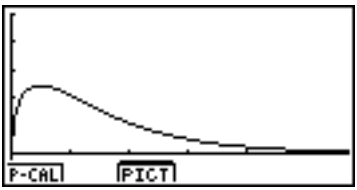
④ F1(CALC)



Result Screen



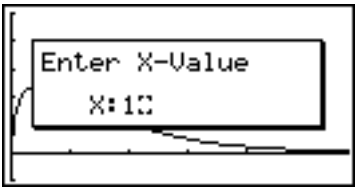
Result: p = 0.242



⑤ ESC

F6(DRAW)

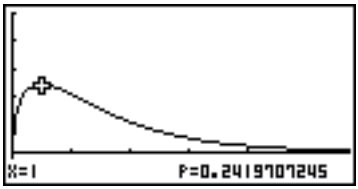
(Pressing F6(DRAW) draws the graph.)



⑥ F1(P-CAL)

1 EXE

Enter the X-coordinate.



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

■ χ^2 Distribution Probability

Set Up

1. On the icon menu, select STAT2.

Execution

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

● ● ● ● ●

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

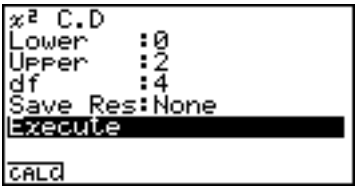
Procedure

① MENU STAT2

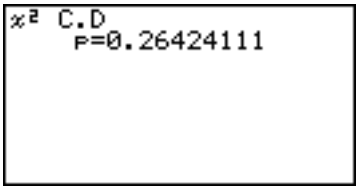
② F5(DIST) 3(χ^2) 2(C.D)

③ 0 EXE
2 EXE
4 EXE
F1(None)▼

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 freedem is 24 and denominator degrees of freedom is 19.**

Procedure

① MENU STAT2

② F5(DIST) 4(F) 1(P.D)

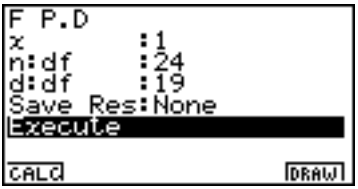
③ 1 EXE

2 4 EXE

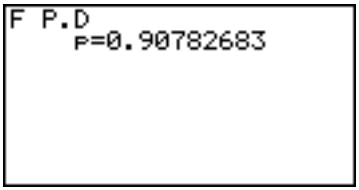
1 9 EXE

F1(None) ▼

④ F1(CALC)



Result Screen

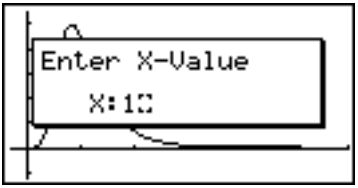


Result: p = 0.908

⑤ ESC

F6(DRAW)

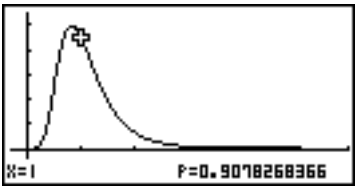
(Pressing F6(DRAW) draws the graph.)



⑥ F1(P-CAL)

1 EXE

Enter the X-coordinate.



The ✜ 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

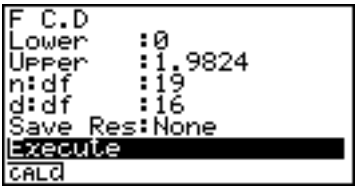
1 • 9 8 2 4 EXE

1 9 EXE

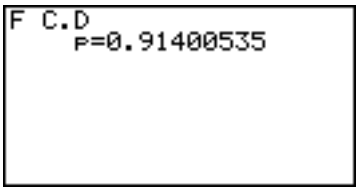
1 6 EXE

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. F5(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) ▼

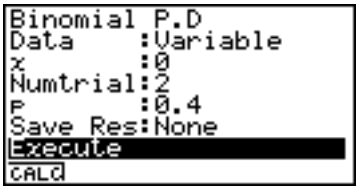
0 EXE

2 EXE

• 4 EXE

F1 (None) ▼

④ F1 (CALC)



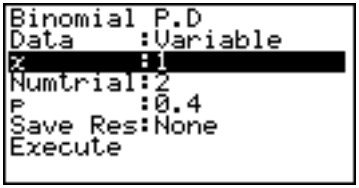
ESC

▼ ▼

1 EXE

▼ ▼ ▼

F1 (CALC)



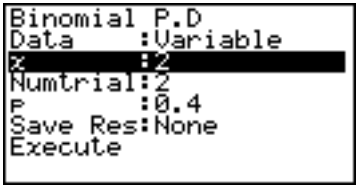
ESC

▼ ▼

2 EXE

▼ ▼ ▼

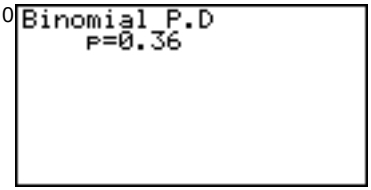
F1 (CALC)



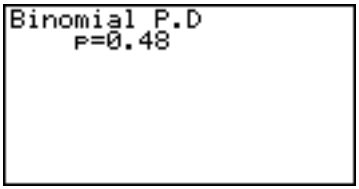
Result Screen

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

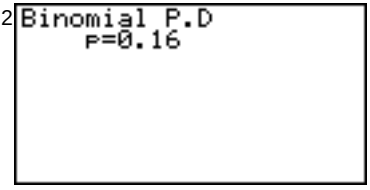
x = 0



x = 1



x = 2



■ 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) 5(Binmal) 2(C.D) ... Binomial Cumulative Density
4. Set calculation parameters.
5. Align the cursor with [Execute]
   F1(CALC) ... Performs calculation.

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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?

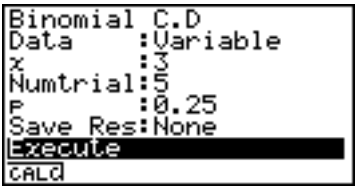
Procedure

① MENU STAT2

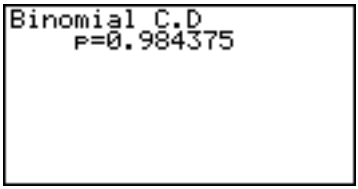
② F5(DIST) 5(Binmal) 2(C.D)

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) 6(Poissn) 1(P.D) ... Poisson Probability
4. Set calculation parameters.
5. Align the cursor with [Execute]
   F1(CALC) ... Performs calculation.

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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 (Poissn) 1 (P.D)

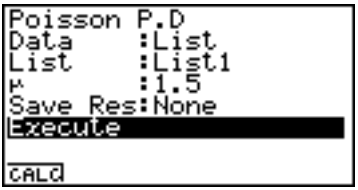
④ F1 (LIST) ▼

F1 (LIST) 1 EXE ▼

1 • 5 EXE

F1 (None) ▼

⑤ F1 (CALC)



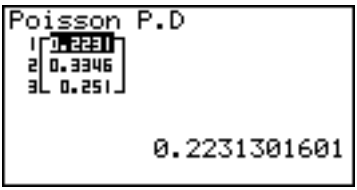
Result Screen

Result:

μ = 0 p = 0.223

μ = 1 p = 0.335

μ = 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) 6(Poissn) 2(C.D) ... Poisson Cumulative Density
4. Set calculation parameters.
5. Align the cursor with [Execute]

   F1(CALC) ... Performs calculation.

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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?**

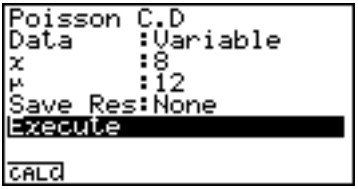
Procedure

① MENU STAT2

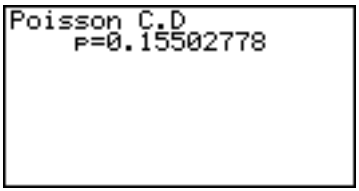
② F5 (DIST) 6 (Poissn) 2 (C.D)

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. F5(DIST) 7(Geo) 1(P.D) ... Geometric Probability
4. Set calculation parameters.
5. Align the cursor with [Execute]
   F1(CALC) ... Performs calculation.

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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?**

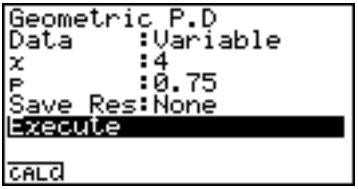
Procedure

① MENU STAT2

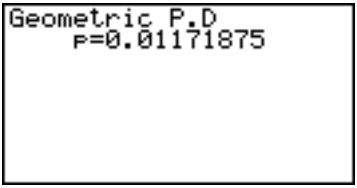
② F5(DIST) 7(Geo) 1(P.D)

③ F2(VAR) ▼
4 EXE
• 7 5 EXE
F1(None) ▼

④ F1(CALC)



Result Screen



Result : p = 0.012

■ Geometric 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) 7(Geo) 2(C.D) ... Geometric Cumulative Density
4. Set calculation parameters.
5. Align the cursor with [Execute]
   F1(CALC) ... Performs calculation.

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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

x = 2

x = 3

x = 4