A Finding probabilities in the t-distribution

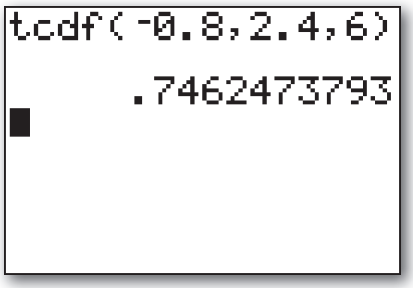
You will need...

- The number of degrees of freedom
- The interval of interest in terms of T

In our example...

- 6
- [-0.8,2.4]

How to do it...

Notes	*You should press*	*You will see*
To get to the correct function	2nd VARS 6 (tcdf( )	
Enter (lower limit, upper limit, degrees of freedom)	(-) 0 . 8 , 2 . 4 , 6 ENTER ENTER ENTER	

What to write down...

If $X \sim t_6$, $P(-0.8 < X < 2.4) = 0.746$ (3SF from GDC)

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

B Finding t-scores given probabilities

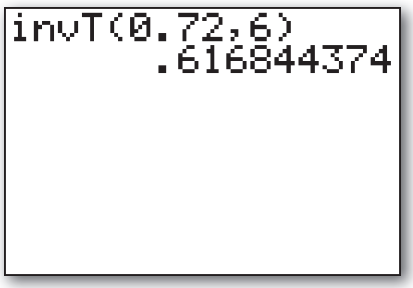
You will need...

- The number of degrees of freedom, ν
- The cumulative probability, $P(T < t)$

In our example...

- 6
- 0.72

How you do it...

Notes	*You should press*	*You will see*
To get to the correct function	2nd VARS 4 (invT( )	
Enter $P(T < t)$, in 'area' then enter the degrees of freedom	0 . 7 2 , 6) ENTER	

What to write down...

If $X \sim t_6$ and $P(X < x) = 0.72$ then $x = 0.617$ (3SF from GDC)

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

C Confidence interval for the mean with unknown variance (from data)

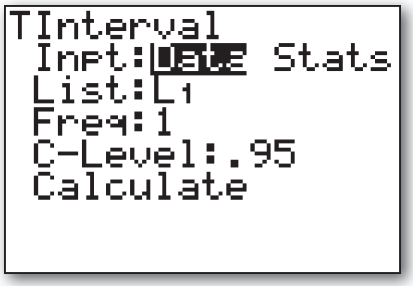
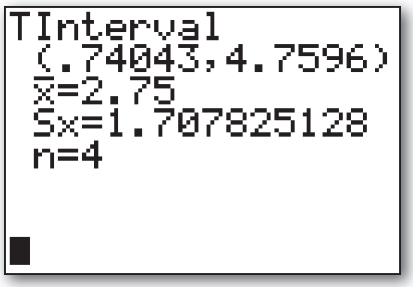
You will need...

- The sample stored in a list (see Calculator skills sheet 11 on the CD-ROM)
- The confidence level.

In our example...

- {1,3,5,2} stored in List 2
- 90%

How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT ▶ ▶ (TESTS) 8 (Tinterval)	
The default setting is to input data. Move down to enter where the data are stored. If the frequencies are stored in another list you can change that too. By default the frequency of each item is 1	▼ 2nd 2 (L_2) ENTER	
Put in the confidence interval as a decimal	▼ ▼ 0 . 9 (C-Level) ENTER ENTER	

What to write down...

$\bar{x} = 2.75,\ s_{n-1} = 1.71$

Using t_3 distribution $0.740 < \mu < 4.76$ (3SF from GDC)

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

D Confidence interval for the mean with unknown variance (from stats)

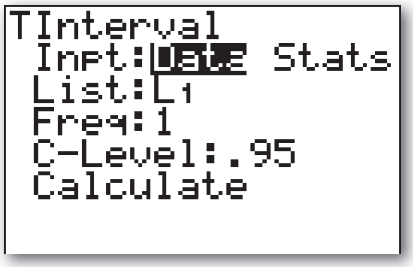
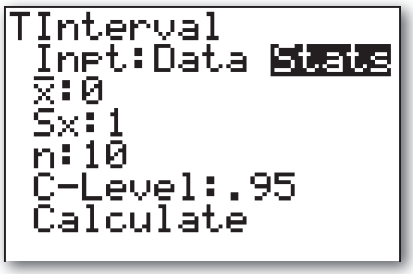
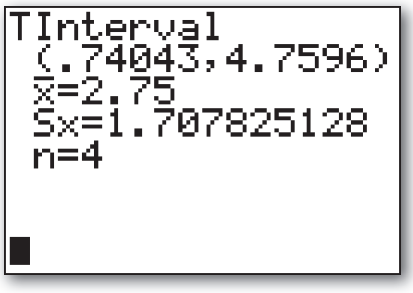
You will need...

- The sample mean ($\bar{x}$)
- Unbiased estimate of population standard deviation (s_{n-1})
- The confidence level

In our example...

- 2.75
- 1.707825128 (stored exactly in A)
- 90%

How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 8 (TInterval)	
Move across to change input method to summary statistics	▶ (Stats) ENTER	
Move down to enter the sample mean	▼ ($\bar{x}$) 2 . 7 5 ENTER	
Enter the standard deviation (S_x)	ALPHA MATH (A) ENTER	
Enter the number of data items (n)	4 ENTER	
Put in the confidence interval as a decimal (C-Level)	0 . 9 ENTER ENTER	

What to write down...

Using the t distribution with $\nu = 3$: $0.740 < \mu < 4.76$ (3SF from GDC)

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

E Hypothesis test for the mean with unknown variance (from data)

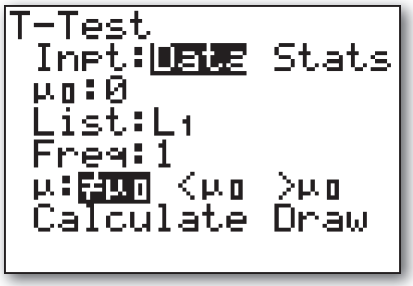
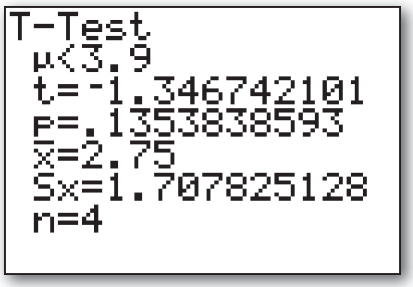
You will need...

- The sample stored in a list
- The mean under the null hypothesis (μ_0)
- The alternative hypothesis.

In our example...

- {1,3,5,2} stored in List 2
- 3.9
- $\mu < \mu_0$

How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 2 (T-Test)	
The default setting is to input data. Move down to enter the mean under the null hypothesis	▼ 3 . 9 ENTER	
You may need to change the list being used. If the frequencies are stored in another list you can change that too. By default the frequency of each item is 1	2nd 2 (L_2) ENTER	
Select which alternative hypothesis you wish to test	▼ ▶ ($< \mu_0$) ENTER ▼ (Calculate) ENTER	

What to write down...

Under H_0, $T = \dfrac{\bar{x} - 3.9}{\sqrt{s_{n-1}/n}} \sim t_{n-1}$.

$\bar{x} = 2.75,\ s_{n-1} = 1.71,\ \nu = 3,\ T = -1.35$

$p - \text{value} = 0.135$

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

F Hypothesis test for the mean with unknown variance (from stats)

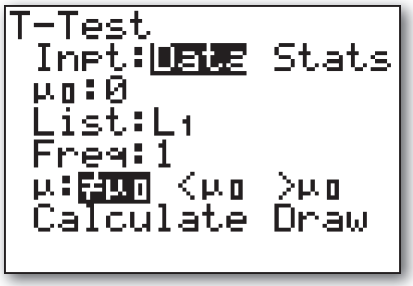
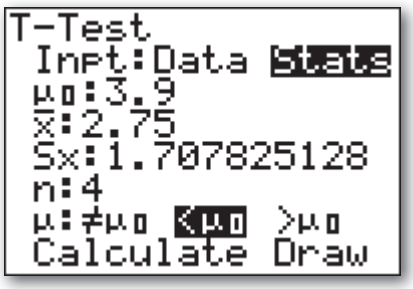
You will need...

- The sample mean
- The unbiased estimate of the sample standard deviation (s_{n-1})
- The number of data items (n)
- The mean under the null hypothesis (μ_0)
- The alternative hypothesis

In our example...

- 2.75
- 1.707825128 (stored exactly in A)
- 4
- 3.9
- $\mu < \mu_0$

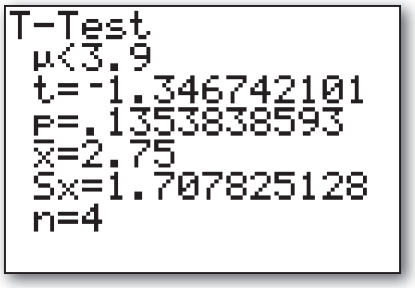
How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 2 (T-Test)	
Change the setting to input summary statistics	▶ (Stat) ENTER	
Move down to enter the mean under the null hypothesis	▼ 3 . 9 ENTER	
Enter the sample mean	2 . 7 5 ENTER	
Enter the standard deviation	ALPHA MATH (A) ENTER	
Enter the number of data items (n)	4 ENTER	
Select which alternative hypothesis you wish to test	▼ ▶ $(< \mu_0)$ ENTER ▼ (Calculate) ENTER	

instructions continue on next page ⟶

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

continued ...

What to write down...

Under H_0, $T = \dfrac{\bar{x} - 3.9}{\sqrt{s_{n-1}/n}} \sim t_{n-1}$.

$$T = -1.35, \quad \nu = 3$$

$$p - \text{value} = 0.135$$

TEXAS*®

G Confidence interval for the mean with known variance (from data)

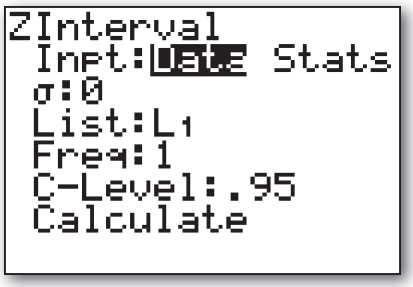
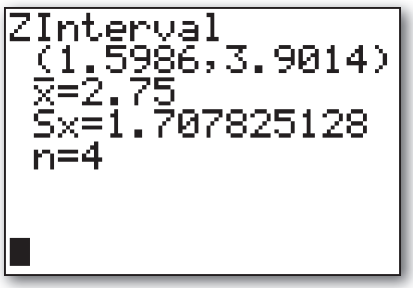
You will need...

- The sample stored in a list (see Calculator skills sheet 11 on the CD-ROM)
- The population standard deviation (σ)
- The confidence level.

In our example...

- {1,3,5,2} stored in List 2
- 1.4
- 90%

How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 7 (Z-Int)	
The default setting is to input data. Move down to set the standard deviation	▼ (σ) 1 . 4 ENTER	
You may need to change the list being used. If the frequencies are stored in another list you can change that too. By default the frequency of each item is 1	2nd 2 (L_2) ENTER	
Put in the confidence interval as a decimal	▼ ▼ (C-Level) 0 . 9 ENTER ENTER	

What to write down...

Using normal distribution:

$\bar{x} = 2.75$

$1.60 < \mu < 3.90$ (3SF from GDC)

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

TEXAS*®

H Confidence interval for the mean with known variance (from stats)

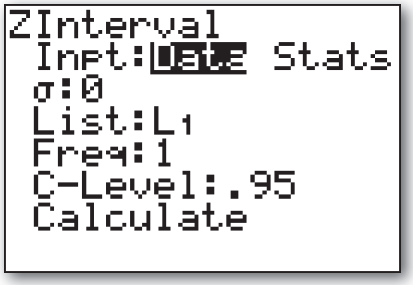
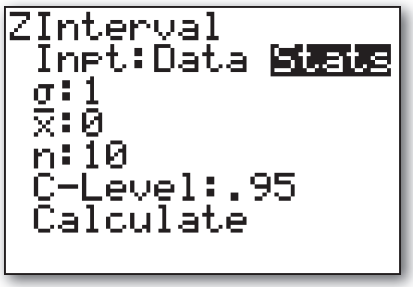
You will need...

- The sample mean ($\bar{x}$)
- The population standard deviation (σ)
- The number of data items (n)
- The confidence level

In our example...

- 2.75
- 1.4
- 4
- 90%

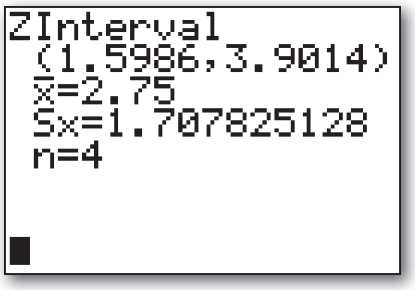
How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 7 (Z-Int)	
Change the setting to input summary statistics	▶ (Stats) ENTER	
Move down to set the standard deviation	▼ (σ) 1 . 4 ENTER	
Enter the sample mean ($\bar{x}$)	2 . 7 5 ENTER	
Enter the number of data items (n)	4 ENTER	

instructions continue on next page ⟶

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

continued ...

Enter the confidence interval as a decimal (C-Level)	0 . 9 ENTER ENTER	

What to write down...

Using normal distribution:

$1.60 < \mu < 3.90$ (3SF from GDC)

I Hypothesis test for the mean with known variance (from stats)

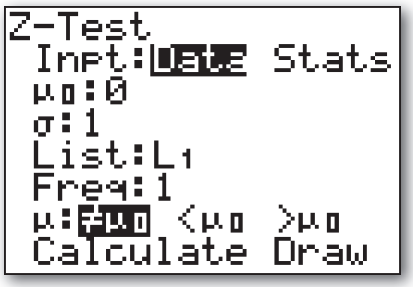
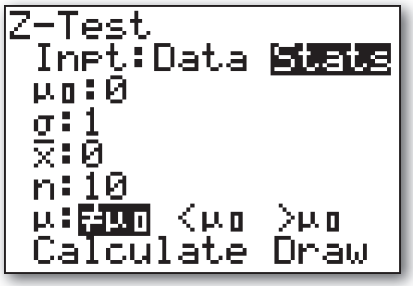
You will need...

- The sample mean
- The population standard deviation (σ).
- The number of data items (n)
- The mean under the null hypothesis (μ_0)
- The alternative hypothesis

In our example...

- 2.75
- 1.4
- 4
- 3.9
- $\mu < \mu_0$

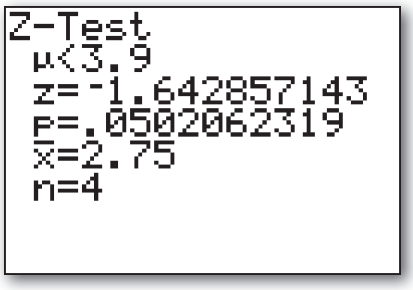
How you do it...

Notes	*You should press*	*You will see*
To get to the correct menu	STAT (Stat) ▶ ▶ (Test) 1 (Z-Test)	
Change the setting to input summary statistics	▶ (Stats) ENTER	
The default setting is to input data. Move down to enter the mean under the null hypothesis	▼ 3 . 9 ENTER	
Enter the standard deviation	1 . 4 ENTER	
Enter the sample mean $(\bar{x})$	2 . 7 5 ENTER	
Enter the number of data items (n)	4 ENTER	

instructions continue on next page ⟶

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.

continued ...

Select which alternative hypothesis you wish to test	▼ ▶ ($< \mu_0$) ENTER ▼ (Calculate) ENTER	

What to write down...

Under H_0, $Z = \dfrac{\bar{x} - 3.9}{\sqrt{1.4/4}} \sim N(0,1)$.

$Z = -1.64$

$p - \text{value} = 0.0502$

TEXAS*®

J Finding the correlation coefficient and the equation of the regression line

Working with bivariate data

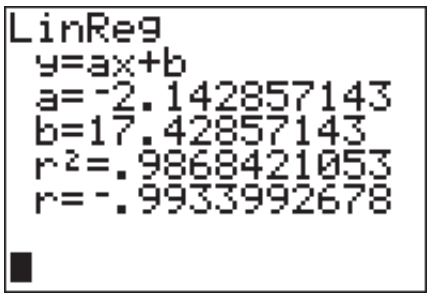
You will need...

- The x-data stored in list 1
- The y-data stored in list 2

In our example...

- {3, 3, 10}
- {12, 10, −4}

How you do it...

Notes	*You should press*	*You will see*
Ensure that the calculator is set to "Diagnostics On".	2nd 0 (Catalog) ▼ ... ▼ (Diagnostics on) ENTER ENTER	
Use the linear regression function	STAT ▶ (Calc) 4 (LinReg(ax+b)) ENTER	

What to write down...

From GDC $r = -0.993$ and $y = -2.14x + 17.4$

* These instructions were written based on the TEXAS model T1-84 Plus Silver Edition and might not be true for other models. If in doubt, consult your calculator's manual.