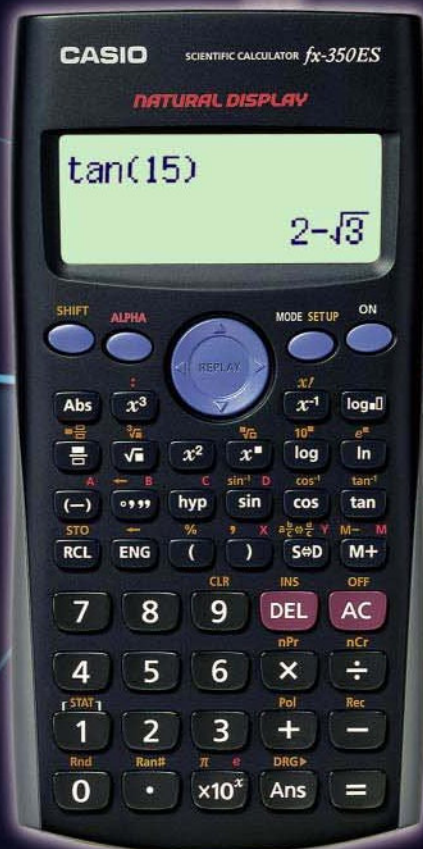


CASIO®

**SUPPORT
CLASSROOM** with
TECHNOLOGY

FX-350ES One Page Wonder



**What you see is
what you enter.**

Natural Textbook Display

*Sophisticated Scientific Calculators
Casio FX Series*

INTRODUCTION

Welcome to the world of Casio's Natural Display scientific calculators.

Our experiences of working with people have us understand more about obstacles people face adapting to a new scientific calculator, or any ICT tool for that matter. The most prevalent issue is how to get started using the tool in the shortest time possible. This is especially true as the scientific calculator gets more sophisticated; yet people have less time to learn its many functions through the user manual even it is extremely comprehensive.

To resolve this issue, we came up with this one-page exercises idea. The key idea is to design a series of exercises where each exercise should be just 1-page long and is independent of each other. One important criterion of the design is that we want you to be able to use any one of these exercises with the calculator immediately, regardless of your calculator skill's level. Just as important is that each exercise must be short, functional yet not too complex to use. So, based on the design principles just described we are proud to present to you the ***FX-350ES One Page Wonder***.

You can begin using this resource by first look up the **LIST OF EXERCISES** in next page and find the exercise which suits your needs. The page number of each exercise is given at the middle column of the list. You can make copies of any of the activities for your class, share it with your friends, or just use them yourself. We would like to stress that the one-page exercise is not a replacement of the user guide that comes with your calculator but rather to serve as a supplement to it.

Please write to us at info@qed-edu.com if you have any comments or ideas. We love to hear from you.

Mun Chou, Fong

QED Education Scientific Sdn. Bhd.

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This publication makes reference to the Casio FX-350ES, FX-570ES and FX-991ES scientific calculators. These model descriptions are the registered trademark of Casio Computer Inc.

LIST OF EXERCISES

<u>Name of Exercise</u>	<u>Page</u>	<u>Exercise Purpose</u>
SETTING DISPLAY 1	1	These 3 exercises provide the orientation on setting the input output method, screen contrast and decimal point.
SETTING DISPLAY 2	2	
SETTING DISPLAY 3	3	
BASIC SCIENTIFIC CALCULATION 1	4	These 3 exercises help you on cube root, trigonometry, combination, n^{th} power expression, polar coordinates and storing value in memory
BASIC SCIENTIFIC CALCULATION 2	5	
BASIC SCIENTIFIC CALCULATION 3	6	
FRACTIONS	7	To do fraction in Natural Display.
TABLE OF VALUES	8	To create table of values of function.
SINGLE VARIABLE STATISTICS 1	9	To find mean and standard deviation.
SINGLE VARIABLE STATISTICS 2	10	To work on grouped 1-variable data.
LINEAR REGRESSION	11	To work on regression with focus on LR.
LOGARITHMIC	12	To do logarithmic operations in Natural Display.

Special Notes for User of FX-350ES, FX-570ES and FX-991ES:

- The FX-ES calculator has a setting area (tap **SHIFT** **MODE**) where we can make preferred settings. When we get unexpected calculation output from the calculator, usually it is due to inappropriate setting. It can easily be resolved: tap **SHIFT** **MODE**, check the current setting, and make the change.
- With list based statistics there is no need to reset STAT mode memory. However, the STAT setting now becomes quite important. For example, if "Frequency" is turn ON, then you would see **FREQ** column appears and this affects your data entry process and subsequently the output will be too. Therefore each time you start using STAT mode, it is generally a good practice to clear the Setup by tapping **SHIFT** **9** **1** **≡**; alternatively, you can check the STAT setting through **SHIFT** **MODE** **▼** **4** and make the change.

Casio FX-350ES One Page Exercise: SETTING DISPLAY 1

>>> Set the contrast of the display.

What To Do

First turn on the calculator.

ON

The Screen Display



Enter the calculator set up, then go down and select "CONT".

SHIFT

MODE



```
1:MthIO  2:LineIO
3:Deg    4:Rad
5:Gra    6:Fix
7:Sci    8:Norm
```

```
1:ab/c  2:d/c
3:STAT  4:Disp
5:◀CONT▶
```

5

```
CONTRAST
LIGHT    DARK
[◀]      [▶]
```

Use the left right arrow keys to control contrast. Once done press "AC" to return to normal display.



AC



Casio FX-350ES One Page Exercise: SETTING DISPLAY 2

>>> To set the decimal point displayed as comma.

What To Do

First turn on the calculator, set calculator to “COMP” mode.

ON **MODE** **1**

The Screen Display



Enter the calculator set up, go down the menu, select “Disp” and then choose “Comma”.

SHIFT **MODE**



```
1:MthIO  2:LineIO
3:Deg    4:Rad
5:Gra    6:Fix
7:Sci    8:Norm
```

```
1:ab/c   2:d/c
3:STAT   4:Disp
5:◀CONT▶
```

4

```
Decimal Point?
1:Dot      2:Comma
```

2



Try press the following to see the outcome.

1 **2** **.** **7** **×** **3** **.** **4** **=** **S↔D**

```
12.7×3.4
43.18
```

To display the comma point as dot, return to set up and select “Dot” in “Disp”.

SHIFT **MODE** **4**

```
Decimal Point?
1:Dot      2:Comma
```

1 **S↔D**

```
12.7×3.4
43.18
```

Casio FX-350ES One Page Exercise: SETTING DISPLAY 3

>>> Set the Input Output method of the calculator as MathIO.

What To Do

First turn on the calculator and set the calculator to “COMP” mode.

ON **MODE** **1**

The Screen Display



Enter the calculator set up, and select “MathIO”.

SHIFT **MODE**

1

```
1:MthIO 2:LineIO
3:Deg 4:Rad
5:Gra 6:Fix
7:Sci 8:Norm
```



Now the calculator is in Natural Input Output Display or MathIO, try the following exercise.

√ **8** **=**



>>> To reset the Input Output method of the calculator as LineIO.

What To Do

After the above exercise, enter the calculator set up, and select “LineIO”.

SHIFT **MODE**

2

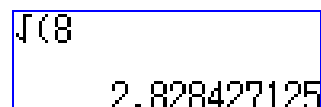
The Screen Display

```
1:MthIO 2:LineIO
3:Deg 4:Rad
5:Gra 6:Fix
7:Sci 8:Norm
```



Now the calculator is reset to normal display or LineIO, try the following exercise.

√ **8** **=**



Casio FX-350ES One Page Exercise: BASIC SCIENTIFIC CALCULATIONS 1

>>> Find $\sin 36^\circ$.

What To Do

First turn on the calculator, set calculator to "COMP" mode and angle to "Deg". Also, choose to do the calculation with MathIO.

ON **MODE** **1** **SHIFT** **MODE** **3**

SHIFT **MODE** **1**

The Screen Display

|

1: MthIO	2: LineIO
3: Deg	4: Rad
5: Gra	6: Fix
7: Sci	8: Norm

Now enter the expression for evaluation.

sin **3** **6** **)** **=**

sin(36)

0.5877852523

>>> Evaluate $\cos(29^\circ 32')$.

What To Do

After the exercise above, we enter this expression for evaluation.

COS **2** **9** **°'** **3** **2** **°'** **)** **=**

The Screen Display

cos(29°32')

0.8700690682

>>> Find $\sqrt[3]{-1331}$.

What To Do

Following the above exercise, first we enter the cube root sign.

SHIFT **$\sqrt[\square]{\square}$** ($\sqrt[3]{\square}$)

The Screen Display

$\sqrt[3]{\square}$

Now enter the radicand for evaluation.

(-) **1** **3** **3** **1** **=**

$\sqrt[3]{-1331}$

-11

Casio FX-350ES One Page Exercise:
BASIC SCIENTIFIC CALCULATIONS 2

>>> Evaluate C_6^{15} .

What To Do

First turn on the calculator, set calculator to "COMP" mode and set up to MathIO.

ON **MODE** **1** **SHIFT** **MODE** **1**

The Screen Display



Now enter the expression of the combination for evaluation.

1 **5** **SHIFT** **÷** **6** **=**



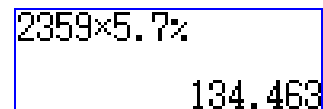
>>> Find out what 5.7% of 2359 is and then store this value to variable A.

What To Do

After the above exercise, we enter the expression to find the value.

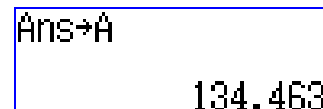
2 **3** **5** **9** **×** **5** **.** **7** **SHIFT** **(** **(%)**
=

The Screen Display



Now store the answer into A.

SHIFT **RCL** **(-)**



>>> Evaluate $\left(\frac{1}{1+e^2}\right)^4$.

What To Do

After the percentage exercise above, we enter the fourth power rational expression for evaluation.

(**1** **+** **SHIFT** **ln** **(e^x)** **2** **)**
^ **4** **=**

The Screen Display



Casio FX-350ES One Page Exercise: BASIC SCIENTIFIC CALCULATIONS 3

>>> Evaluate $\sqrt[6]{729}$.

What To Do

First turn on the calculator, set to "COMP" mode and put the set up to MathIO.

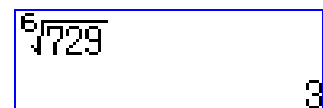
ON **MODE** **1** **SHIFT** **MODE** **1**

The Screen Display



Now enter the expression for evaluation.

SHIFT **x[■]** ($\sqrt[n]{\square}$) **6** **▶** **7** **2** **9** **=**



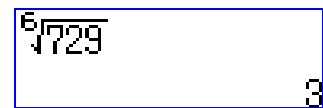
>>> Express the rectangular coordinates of (3, 4) in polar form.

What To Do

After the above exercise, we should set the calculator to degree mode if it is not.

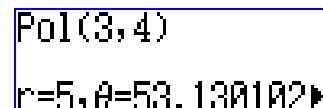
SHIFT **MODE** **3**

The Screen Display



Now we call up the "Pol" function, enter the given coordinates, and then evaluate.

SHIFT **+** **3** **SHIFT** **)** **4** **)** **=**



>>> Convert 2π to its degree equivalent.

What To Do

After the previous exercise, we enter the following to find its degree equivalent.

2 **SHIFT** **x10^{-x}** (π) **SHIFT** **Ans** (DRG▶) **2** **=**

The Screen Display



Casio FX-350ES One Page Exercise: FRACTIONS

>>> Perform the fraction calculation $\frac{2}{5} + \frac{5}{6}$.

What To Do

The Screen Display

First turn on the calculator, set calculator to "COMP" mode and set up to MathIO.

ON **MODE** **1** **SHIFT** **MODE** **1**

Now press the fraction key, and then enter the first fraction.



$\frac{\square}{\square}$

2 **▼** **5**

$\frac{2}{5}$

Move cursor to the right of first fraction and enter the operation "+".

▶ **+**

$\frac{2}{5} +$

Now enter the second fraction.

▶ **5** **▼** **6**

$\frac{2}{5} + \frac{5}{6}$

Press "=" to get the result. You can also display result in proper form.



$\frac{2}{5} + \frac{5}{6}$

$\frac{37}{30}$

SHIFT **S↔D** ($a\frac{b}{c} + \frac{d}{e}$)

$\frac{2}{5} + \frac{5}{6}$

$1\frac{7}{30}$

Casio FX-350ES One Page Exercise: TABLE OF VALUES

>>> Create a table of values for $y = x^2 + 1$ for $-3 \leq x \leq 5$.

What To Do

First turn on the calculator and set calculator to "TABLE" mode.

ON **MODE** **3**

The Screen Display

f(X)=

Now enter the expression.

ALPHA **)** **x²** **+** **1**

f(X)=X²+1

=

Start?
1

We use -3 as Start value, 5 as End value and 1 as Step value. (Step value = increment size of x)

(-) **3** **=** **5** **=**

Step?
1

1 **=**

X	F(X)
1	2
2	5
3	10

View the table using the up down arrow keys.

▲ **▼**

X	F(X)
4	17
5	26
6	37

Casio FX-350ES One Page Exercise: SINGLE VARIABLE STATISTICS 1

>>> Find the mean and sample standard deviation for these data: 2, 4, 7, 4, 9, 13, 6, 8, 7.

What To Do

Turn on the calculator, clear the set up¹ and set calculator to "STAT" mode.

ON **SHIFT** **9** **1** **=** **AC** **MODE** **2**

The Screen Display

```

1: 1-VAR  2: A+BX
3: 1+CX2 4: ln X
5: eX    6: A·BX
7: A·XB 8: 1/X
  
```

¹ It is generally a good practice to clear the set up as you begin statistical calculation. See List of Exercises page for explanation.

Now choose to do calculation for "1-VAR" and enter the data into the list.

1

```

1-VAR
X
  
```

2 **=** **4** **=** **7** **=** **4** **=** **9**

```

1-VAR
X
4
  
```

Continue entering the rest of the data.

= **13** **=** **6** **=** **8** **=** **7** **=**

```

1-VAR
X
4
13
  
```

Next we clear the screen and find the sample mean.

AC

```

0
  
```

SHIFT **1**

```

1: Type  2: Data
3: Edit  4: Sum
5: Var   6: MinMax
  
```

5 **2** **=**

```

Σx
6.666666667
  
```

And also find the sample standard deviation.

SHIFT **1**

```

1: Type  2: Data
3: Edit  4: Sum
5: Var   6: MinMax
  
```

5 **4** **=**

```

σn-1
3.240370349
  
```

Casio FX-350ES One Page Exercise: SINGLE VARIABLE STATISTICS 2: GROUPED DATA

>>> Find the standard deviation of the grouped data given here.

x	6	15	23	32	40
<i>Frequency</i>	5	13	15	9	6

What To Do

The Screen Display

Turn on the calculator, clear the set up¹ and then enter set up mode to turn “Frequency” on.

ON SHIFT 9 1 = AC SHIFT MODE ▼
3 1



¹ It is generally a good practice to clear the set up as you begin statistical calculation. See List of Exercises page for explanation.

Next we set calculator to “STAT” mode. Then choose “1-VAR” to enter the data provided.

MODE 2

```

1: 1-VAR  2: A+BX
3: +CX2  4: ln X
5: eX     6: A·BX
7: A·XB  8: 1/X

```

1

	X	FREQ
1		

Enter the x -data at the X -column first. .

6 = 1 5 = 2 3 = 3 2
= 4 0 =

	X	FREQ
4		
5		

Continue by entering frequency data at the $FREQ$ -column.

▼ ► 5 = 1 3 = 1 5 =
9 = 6 =

	X	FREQ
4		
5		

Now clear the screen and find the standard deviation.

AC SHIFT 1

```

1: Type   2: Data
3: Edit  4: Sum
5: Var   6: MinMax

```

5 3 =

σn	
	9.986517247

Casio FX-350ES One Page Exercise: LINEAR REGRESSION

>>> Determine the linear correlation coefficient for the paired sample data below:

<i>x</i>	65	75	57	42	86	73	80
<i>y</i>	72	59	68	54	92	68	72

What To Do

The Screen Display

Turn on the calculator, clear the set up¹ and set calculator to “STAT” mode.

ON **SHIFT** **9** **1** **=** **AC** **MODE** **2**

```

1: 1-VAR  2: A+BX
3: 2+CX2 4: ln X
5: eX    6: A·BX
7: A·XB 8: 1/X

```

¹ It is generally a good practice to clear the set up as you begin statistical calculation. See List of Exercises page for explanation.

Select to do calculation for “A+BX” and enter the *x* data at the *X*-column.

2 **6** **5** **=** **7** **5** **=** **5** **7** **=**
4 **2** **=** **8** **6** **=**
7 **3** **=** **8** **0** **=**

```

X  Y
42 0
65 0
75 0

```

```

X  Y
73 0
86 0
80 0

```

Next we go to *Y*-column and enter the *y* data into this column.

▼ **▶**

7 **2** **=** **5** **9** **=** **6** **8** **=** **5**
4 **=** **9** **2** **=** **6** **8** **=** **7** **2**
=

```

X  Y
42 72
65 59
75 68

```

```

X  Y
73 54
86 92
80 68

```

Clear the screen and find the correlation coefficient.

AC

SHIFT **1**

7 **3** **=**

```

0

```

```

1: Type  2: Data
3: Edit  4: Sum
5: Var   6: MinMax
7: Res

```

```

r
0.7064885262

```

Casio FX-350ES One Page Exercise: LOGARITHMICS

>>> Calculate $\log 23$.

What To Do

Turn on the calculator, set calculator to "COMP" mode and set up to MathIO.

ON **MODE** **1** **SHIFT** **MODE** **1**

The Screen Display

Press the following to calculate the expression.

log **2** **3** **)** **=**

log(23)
1.361727836

>>> Find $\log_7 23$ correct to 5 decimal places.

What To Do

From the exercise above, press the following to calculate the given logarithmic expression.

log_□ **7** **▶** **2** **3**

The Screen Display

log₇(23)

Press "=" to get the numerical result.

=

log₇(23)
1.61132528

Now set the calculator to display the result correct up to 5 decimal places.

SHIFT **MODE** **6** **5**

log₇(23)
1.61133

Press the following to return the calculator to normal (Norm-1) display.

SHIFT **MODE** **8**

Norm 1~2?

1

log₇(23)
1.61132528



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Marco Corporation (M) Sdn. Bhd. (013431-H)
No. 2, 2nd Floor, Jalan Segambut, 51200 Kuala Lumpur.
Tel: 03-4043 3111 Fax: 03-4041 9315
Website: www.marco-groups.com