

Math-2
Lesson 3-3
TI-84 Calculator

Try this on your calculator:

- a. Set your "window" to
 $x(\min) = -5$
 $x(\max) = 5$
 $y(\min) = -20$
 $y(\max) = 20$

```
WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```

- b. Graph the following $y = 2x^2 + 4x - 7$

- c. Does the parabola open up or down?
 d. How many "x-intercepts" does it have?

```
Plot1 Plot2 Plot3
Y1=2X^2+4X-7
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
```

"y=" enter
equations here

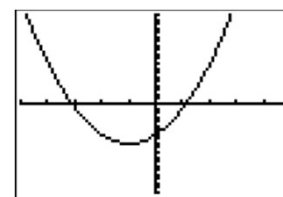
```
Plot1 Plot2 Plot3
Y1=2X^2+4X-7
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
```

'x' variable
button



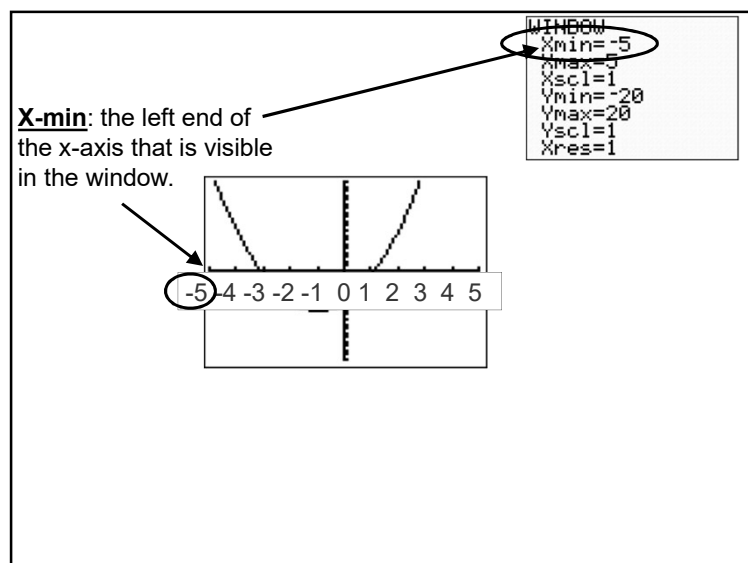
"Window" allows
you to adjust the
x-y axis scale.

```
WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```



Compare the "tic" marks y-
axis to those on the x-axis.

Why are they different?



Using the same equation, change your window

- a. Set your "window" to
- x(min) = -10
 x(max) = 10
 y(min) = -20
 y(max) = 20

```

WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
  
```

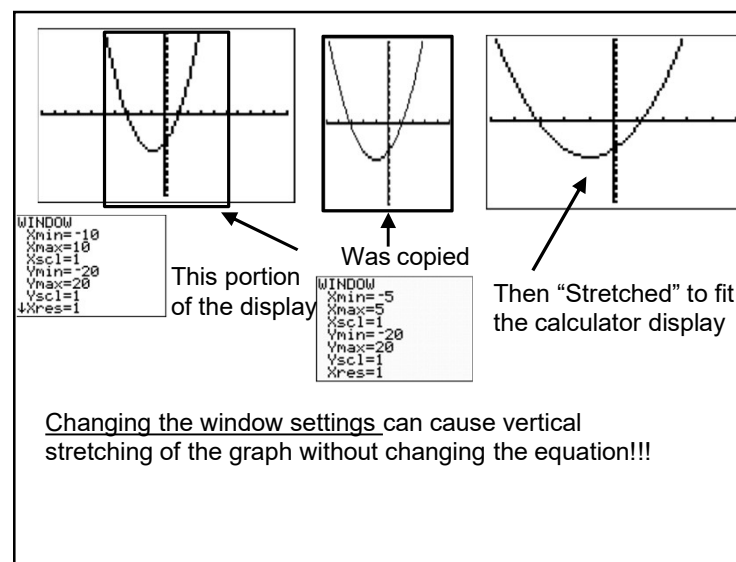
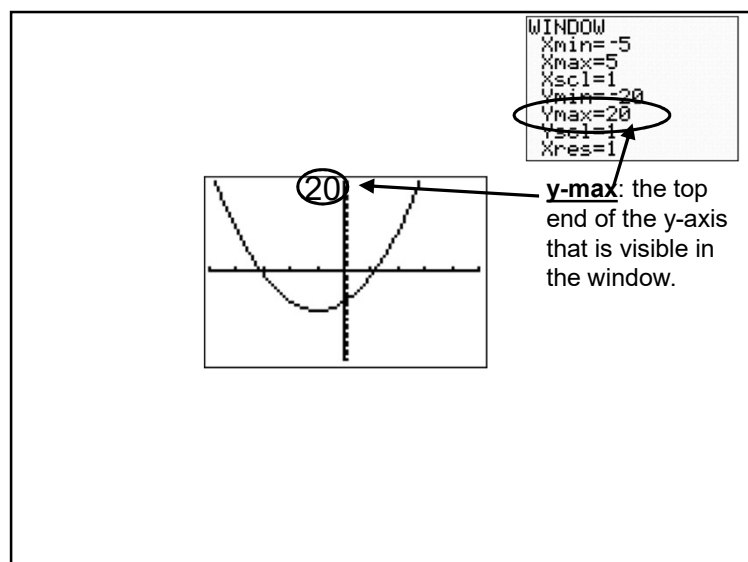
- b. Graph the following $y = 2x^2 + 4x - 7$

- c. What happens to the shape of the graph?

- d. Why did it change?

```

Plot1 Plot2 Plot3
Y1=2X^2+4X-7
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
  
```



Using the same equation (that you already entered):

- a. Set your "window" to

x(min) = -20
x(max) = 20
y(min) = -20
y(max) = 20

```
WINDOW
Xmin=-20
Xmax=20
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```

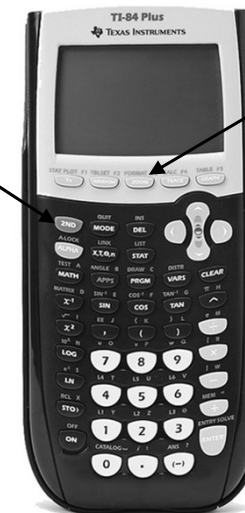
- b. Will the graph be narrower or wider?

- c. Graph the same equation

$$y = 2x^2 + 4x - 7$$

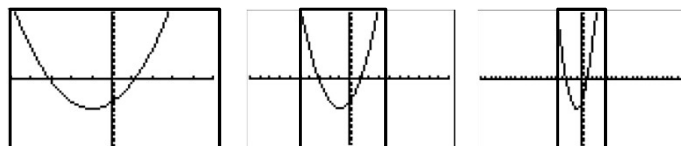
```
Plot1 Plot2 Plot3
V1: 2X^2+4X-7
V2=
V3=
V4=
V5=
V6=
V7=
```

"2nd" allows
you to have
more than one
feature



"2nd Calc" allows
you to use the
"power of the
calculator".

```
2nd CALC
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```



```
WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```

```
WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```

```
WINDOW
Xmin=-20
Xmax=20
Xscl=1
Ymin=-20
Ymax=20
Yscl=1
Xres=1
```

As you increase the width of the window, the graph occupies a smaller and smaller portion of the window.

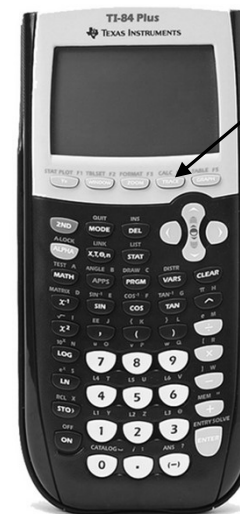
To return the "window" to the standard +/- 10 units hit "zoom"



then "6"

```
ZOOM MEMORY
1:ZBox
2:Zoom In
3:Zoom Out
4:ZDecimal
5:ZSquare
6:ZStandard
7:ZTrig
```

```
WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-10
Ymax=10
Yscl=1
Xres=1
```

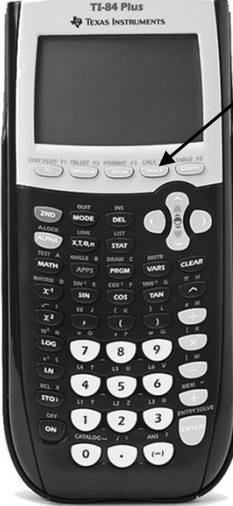


"2nd Calc"

"value":
calculates an
output value for
your input.

```
2nd CALC
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

Try this for x = 2
(it will use the
equation you've
entered into "y="




"2nd Calc"

"zero":
calculates
"zeroes" of the
equation in "y=".

I'll show you how
to do this in a
minute.

```

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
  
```

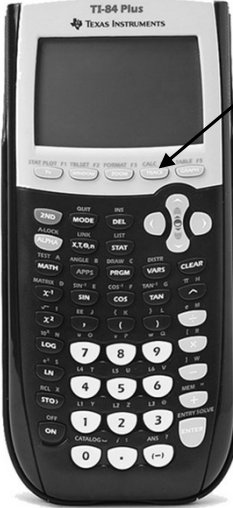


"2nd Calc"

"maximum":
finds "relative
minimum" values
of the function in
"y=".

```

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
  
```




"2nd Calc"

"minimum":
finds "relative
minimum" values
of the function in
"y=".

```

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
  
```




"2nd Calc"

"intersect":
finds the location of where
two graphs cross (must
have 2 equations in "y=".

```


CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
  
```



"2nd Calc"

Items '6' and '7' are used in calculus

CALCULATE
 1:value
 2:zero
 3:minimum
 4:maximum
 5:intersect
 6:dy/dx
 7:∫f(x)dx

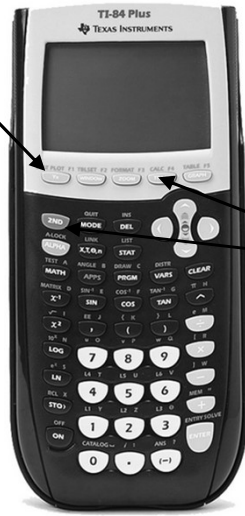


$y = 4x - 7$

x	0	1	2	3	4
y					

Repeat the previous steps to fill in the rest of the table.
 There's an easier way to do this.

"2nd" + "graph"



"y ="

$y = 4x - 7$

Find the y-value that corresponds to an x-value of 3.

Enter the equation into the "y-editor"

"2nd" + "calculate"

CALCULATE
 1:value
 2:zero
 3:minimum
 4:maximum
 5:intersect
 6:dy/dx
 7:∫f(x)dx

Type in a "1"
 Type in '2' for x.

Finding where lines cross.

1. Enter the following 2 equations.

$y = 2x - 4$ $y = -2x + 4$

"2nd" + "calculate"

CALCULATE
 1:value
 2:zero
 3:minimum
 4:maximum
 5:intersect
 6:dy/dx
 7:∫f(x)dx

Answer the questions →
 "enter" means "yes"

Finding the vertex.

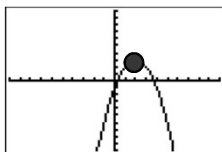
1. Graph the equation.

```

Plot1 Plot2 Plot3
Y1=-(X-2)^2+3
Y2=
Y3=
Y4=
Y5=
Y6=

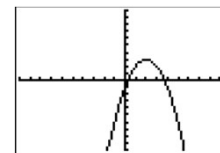
```

2. Where is vertex?



Use the "power of the calculator" to find the vertex.

1. Graph the equation.



2. What buttons do you push to use the "power of the calculator" to find the function's maximum value?

"2nd" + "calculate" + "4" ("maximum")

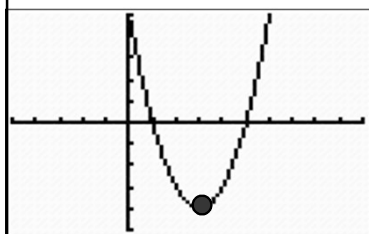
```

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx

```

Vocabulary

Maximum/minimum: The highest or lowest point on the graph.

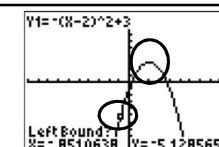


What are the coordinates of the maximum?

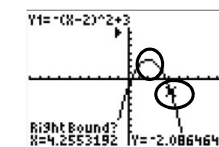
(2, 3)

We must "bracket" the vertex.

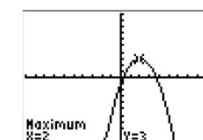
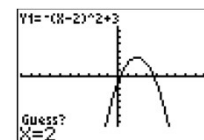
Move the "cursor" on the graph to the left of the vertex and push "enter".



Move the "cursor" to the right side of the vertex and push "enter".



Guess and x-value of the vertex and push "enter".



(2, 3) (absolute) maximum