

Choosing a WINDOW

Graph a function and change window dimensions in order to see the graph.

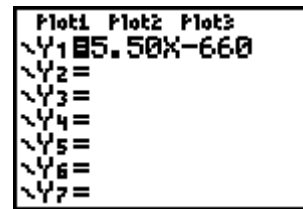
We will use the rule $P(a) = 5.50a - 660$.

Keystrokes

Screen

Enter the function into the equation editor:

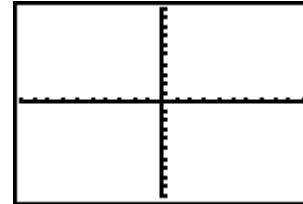
$Y = 5.50 X - 660$



Take an initial look at the graph:

GRAPH

Note: your screen may appear different; press **ZOOM** and then select **6:ZStandard** to get the same screen as shown here.



The current display only shows the coordinate axes; the window is set to show horizontal and vertical values only between -10 and 10. For the current function, no input/output values fall within these bounds, so we must change the WINDOW. There are many ways to determine what the appropriate settings could be. We demonstrate one method here.

Look at the Table Setup:

2nd WINDOW

Note: your initial setup may be different than the one shown here.



TblStart is the first input value for your table. For this example, change the TblStart to 0:

0 ENTER



ΔTbl is the step size for the input values for the table. For this example, change the ΔTbl to 10:

1 0 ENTER



With these settings, the calculator will generate a table of y-values for $y = 5.5x - 660$ and x-values 0, 10, 20, 30, 40, ...

Note: you can use the **Ask** mode to enter input values directly. See **TABLE** handouts.

More questions? Contact the **Metropolitan State University Math Center** at

651-793-1460, 651-793-1463 (Fax) or math.center@metrostate.edu.

Persons with a disability who need reasonable accommodations may call Disability Services at 651-793-1540 or 651-772-7687 (TTY).

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Look at the TABLE of values for the function:

2nd **GRAPH**

Note that when the input is 0, the output is -660.

Scroll down the table until the output is positive:

▼ (13 times)

Note that when the input is 120, the output is 0.

X	Y1	
00000	-660.0	
10.000	-605.0	
20.000	-550.0	
30.000	-495.0	
40.000	-440.0	
50.000	-385.0	
60.000	-330.0	
X=0		

X	Y1	
70	-275	
80	-220	
90	-165	
100	-110	
110	-55	
120	0	
130	55	
X=130		

Look at the WINDOW dimensions:

WINDOW

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

Xmin is the smallest (furthest to the left) input value shown on the horizontal axis. For this example, change the Xmin to -20:

(-) **2** **0** **ENTER**

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

Xmax is the largest (furthest to the right) input value shown on the horizontal axis. For this example, change the Xmax to 120

1 **2** **0** **ENTER**

```
WINDOW
Xmin=-20
Xmax=120
Xscl=1
Ymin=-10
Ymax=10
Yscl=1
Xres=1
```

Note: Xmin must be strictly less than Xmax in order to graph.

Xscl, or X-scale, defines the distance between tick marks on the horizontal axis. For this example, change the Xscl to 20:

2 **0** **ENTER**

```
WINDOW
Xmin=-20
Xmax=120
Xscl=20
Ymin=-10
Ymax=10
Yscl=1
Xres=1
```

Note: you can turn off the tick marks by setting Xscl to 0.

Ymin is the smallest (furthest down) output value shown on the vertical axis. For this example, change the Ymin to -700:

(-) **7** **0** **0** **ENTER**

```
WINDOW
Xmin=-20
Xmax=120
Xscl=20
Ymin=-700
Ymax=10
Yscl=1
Xres=1
```

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Ymax is the largest (furthest up) output value shown on the vertical axis. For this example, change the Ymax to 100:

1 0 0 ENTER

Note: Ymin must be strictly less than Ymax in order to graph.

Yscl, or Y-scale, defines the distance between tick marks on the vertical axis. For this example, change the Yscl to 50:

5 0 ENTER

Note: to turn off tick marks, set Yscl to 0.

Look at the GRAPH:

GRAPH

Note that you can see more of the graph, especially where it crosses the x-axis and the y-axis.

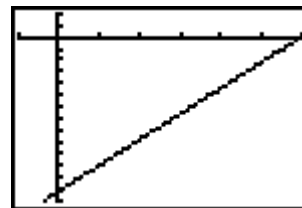
Note: choosing an appropriate window takes time and experimentation. Don't be afraid to make mistakes along the way. If your function represents a "real world problem", then think of the Xmin, Xmax, Ymin, and Ymax as boundaries on your possible inputs and outputs. Because there are so many correct possibilities, your graph may look different than another's graph.

```

WINDOW
Xmin=-20
Xmax=120
Xscl=20
Ymin=-700
Ymax=100
Yscl=1
Xres=1
  
```

```

WINDOW
Xmin=-20
Xmax=120
Xscl=20
Ymin=-700
Ymax=100
Yscl=50
Xres=1
  
```



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