TI-83/84: Equations and Graphs on Your Calculator

First, take a look at the five keys right at the very top of your calculator -- just underneath the screen:

Y =   WINDOW   ZOOM   TRACE   GRAPH

Y = Press this key to get to a screen where you can enter equations.

WINDOW   Use this key to see the settings for the limits of the x and y axes, and the setting
           for the tick marks on the axes.

ZOOM   Use this key to zoom in or out, or just to set the graph to the standard window.

TRACE   Use this key to trace point by point along a graph.   We won't use this much!

GRAPH   Press this key see the graph.

- Now, press ZOOM and choose **6: ZStandard**.   This gives you a graph window where the x-axis goes from -10 to 10, and the y-axis also goes from -10 to 10.   Press WINDOW to see these settings.
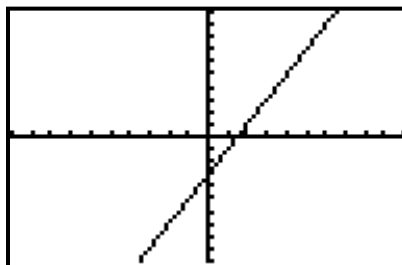
Ymax=10

Yscl=1

Xmin=-10   Xmax=10
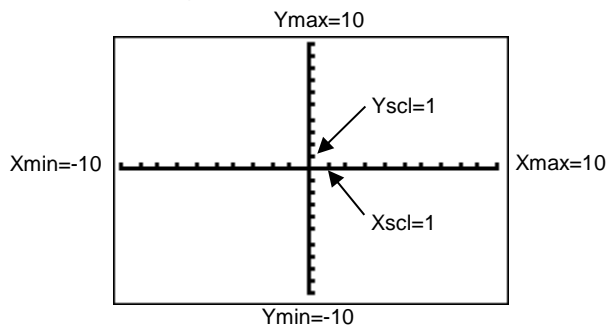
Xscl=1

Ymin=-10

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

- Press Y= to see the screen where you enter equations.
- Type in y_1=2x-3.   (Use the second key on the second row X,T,θ,n to get the x.)

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Plot1  Plot2  Plot3
\Y1■2X-3
\Y2=
\Y3=
```

- Press GRAPH to see the graph.

Notice: this line has a slope of 2, and a y-intercept at -3.   It's the correct line!

Calculator Lines Practice

Now, see if you can match these calculator pictures.   Clear your y= screen, then find the equations that will make your calculator look like the picture.   Write down the equations that you use (the order doesn't matter).

Think about the slope and y-intercept of each line!
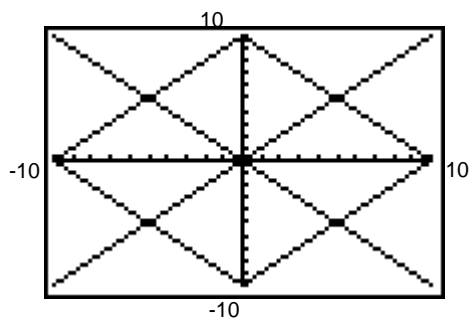
$Y_1 =$ $Y_4 =$

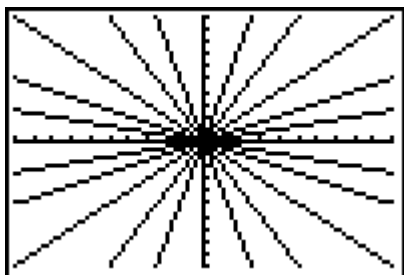$Y_2 =$ $Y_5 =$

$Y_3 =$ $Y_6 =$

$Y_1 =$ $Y_6 =$
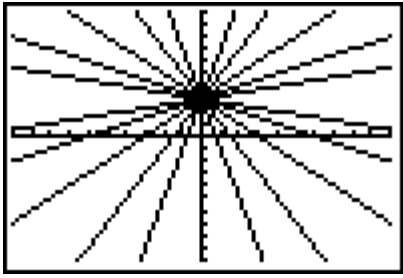
$Y_2 =$ $Y_7 =$

$Y_3 =$ $Y_8 =$

$Y_4 =$ $Y_9 =$

$Y_5 =$ $Y_0 =$

You don't have to be perfect on this picture, but try to get as close as you can!

$Y_1 =$	$Y_6 =$
$Y_2 =$	$Y_7 =$
$Y_3 =$	$Y_8 =$
$Y_4 =$	$Y_9 =$
$Y_5 =$	$Y_0 =$

You don't have to be perfect on this picture,
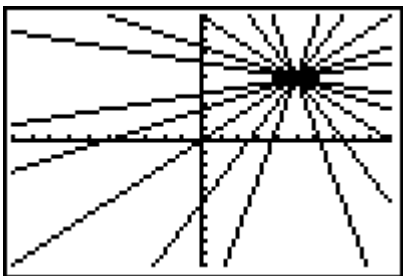but try to get as close as you can!

Hint for the last picture: Use the point-slope formula for a line:

$y = m(x - x_1) + y_1$ where m = slope, and (x_1, y_1) is any point on the line.   You do NOT need to simplify the equations.   All of these lines go through the point (5,5).

So, if your first line has slope 4, its equation should be:

$$y = 4(x - 5) + 5$$

Don't simplify your equations!

$Y_1 =$	$Y_6 =$
$Y_2 =$	$Y_7 =$
$Y_3 =$	$Y_8 =$
$Y_4 =$	$Y_9 =$
$Y_5 =$	$Y_0 =$

You don't have to be perfect on this picture,
but try to get as close as you can!

More Hints about Graphing on Your Calculator:

1) <u>Solve the equation for y.</u>   Type it into the "y=" screen of your calculator.   If you had to take a square root or undo an absolute value in solving for y, remember to use both the positive and negative solutions -- you will get two equations.   Use parentheses appropriately to get the correct order of operations.

2) <u>Estimate an appropriate scale.</u>

   <u>method 1:</u>   can you tell from the equation or from the statement of the problem what the scale should be?

   <u>method 2:</u>   calculate points by hand -- don't forget to pay attention to order of operations. Base your scale on the values you've calculated.

   <u>method 3:</u>   use the TABLE on your calculator to let the calculator figure out many points. Base your scale on the values on the table.

   <u>method 4:</u>   use ZOOM 4: ZDecimal or 6: ZStandard, then look at the graph and adjust the scale so that you can clearly see all the important features of the graph.

3) <u>Enter your chosen scale</u> in the WINDOW screen of the calculator.   Look at the graph -- adjust the scale if necessary.

Use ZOOM DECIMAL, then ZOOM OUT[1] for most graphs on your calculator.   By using ZOOM DECIMAL whenever possible you avoid nasty long decimals on your x values when you trace your graph.

Remember that the graph on your calculator is an extremely precise object, so YOU need to read it extremely precisely.

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[1] On your calculator, take the time now to set your ZOOM factors to 2:
- Press ZOOM
- Right arrow to MEMORY
- Choose 4: Set Factors
- Type in a 2 for both XFact and YFact.
- Press 2nd QUIT