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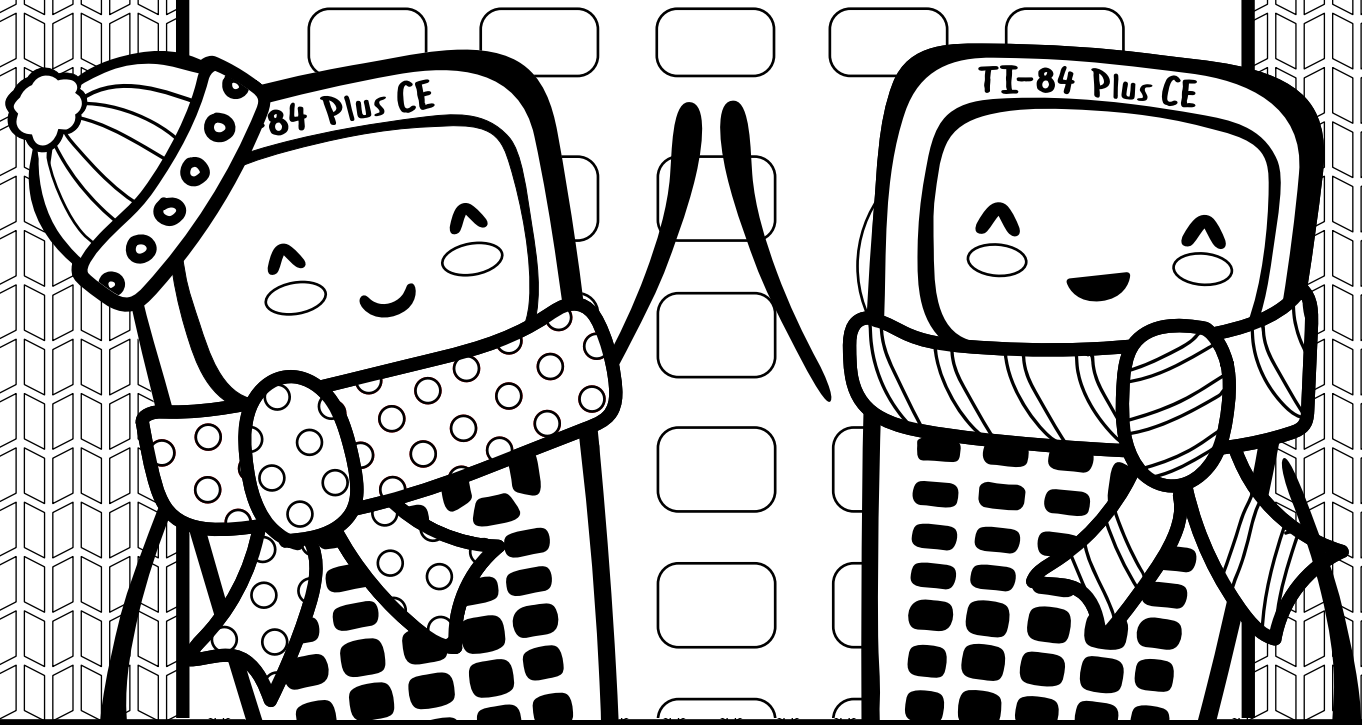
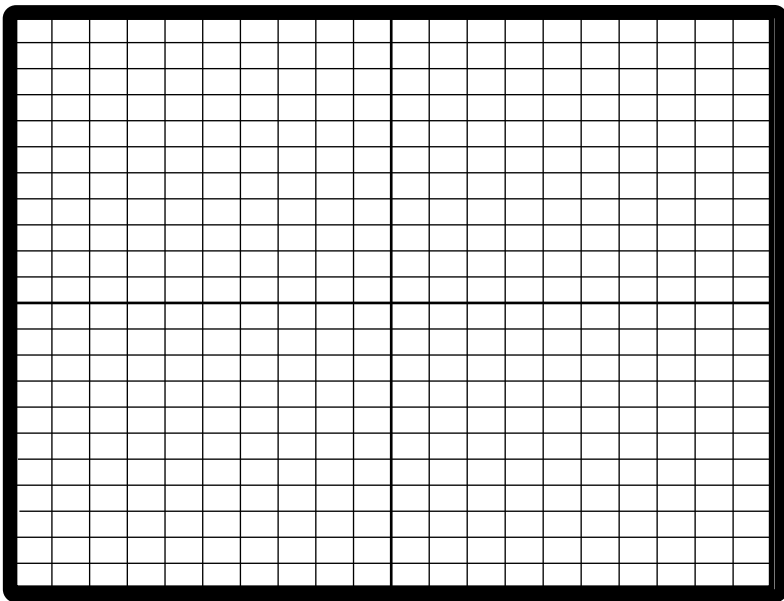
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TI-84 Plus CE



Use the equations and color key sheet to draw a secret image on the graph.

Red

$$f(x) \geq \begin{cases} -6(x+4)^2; -5 < x < -4 \\ (-\frac{3}{8})x^2 + 6; -4 < x < 4 \\ -6(x-4)^2; 4 < x < 5 \end{cases} \quad f(x) = \begin{cases} \sqrt{\frac{1}{4} - (x + \frac{7}{2})^2} - 4; -4 < x < -3 \\ \sqrt{\frac{1}{4} - (x + 2)^2} - 1; -\frac{5}{2} < x < -\frac{3}{2} \\ \sqrt{\frac{1}{4} - x^2} + 2; -\frac{1}{2} < x < \frac{1}{2} \\ \sqrt{\frac{1}{4} - (x - 2)^2} - 1; \frac{3}{2} < x < \frac{5}{2} \\ \sqrt{\frac{1}{4} - (x - \frac{7}{2})^2} - 4; 3 < x < 4 \end{cases}$$

$$f(x) = \begin{cases} (-\frac{4}{25})x^2 - 5; -5 < x < 5 \end{cases}$$

$$f(x) \geq \begin{cases} -6(x+4)^2; -5 < x < -4 \\ (-\frac{3}{8})x^2 + 6; -4 < x < 4 \\ -6(x-4)^2; 4 < x < 5 \end{cases} \quad f(x) = \begin{cases} \sqrt{\frac{1}{4} - (x + \frac{3}{2})^2} + 3; -2 < x < -1 \\ \sqrt{\frac{1}{4} - x^2} - 3; -\frac{1}{2} < x < \frac{1}{2} \\ \sqrt{\frac{1}{4} - (x - \frac{3}{2})^2} + 3; 1 < x < 2 \end{cases}$$

$$x \leq \begin{cases} -5 \end{cases}$$

$$x \geq \begin{cases} 5 \end{cases}$$

Orange

$$f(x) = \begin{cases} \frac{4}{3}x^2 + 6; -\frac{3}{2} < x < \frac{3}{2} \end{cases}$$

$$f(x) = \begin{cases} -4(x+1)^2; -\frac{3}{2} < x < \frac{1}{2} \\ -4x^2 + 9; -\frac{1}{2} < x < \frac{1}{2} \\ -4(x-1)^2 + 9; \frac{1}{2} < x < \frac{3}{2} \end{cases} \quad f(x) = \begin{cases} -\sqrt{\frac{1}{4} - (x + \frac{7}{2})^2} - 4; -4 < x < -3 \\ -\sqrt{\frac{1}{4} - (x + 2)^2} - 1; -\frac{5}{2} < x < -\frac{3}{2} \\ -\sqrt{\frac{1}{4} - x^2} + 2; -\frac{1}{2} < x < \frac{1}{2} \\ -\sqrt{\frac{1}{4} - (x - 2)^2} - 1; \frac{3}{2} < x < \frac{5}{2} \\ -\sqrt{\frac{1}{4} - (x - \frac{7}{2})^2} - 4; 3 < x < 4 \end{cases}$$

Next, graph the equations on your calculator using the Inequalities Application. How do your images compare?

Graph your work

For an uncluttered graph screen:

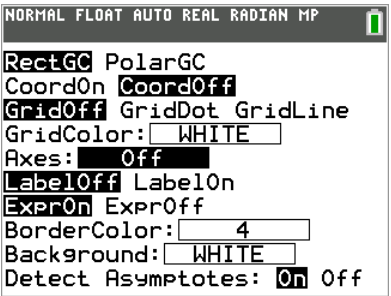


Toggle to and select CoordOff

Toggle to and select GridOff.

Toggle to Axes and select Off.

Toggle to BorderColor and select 4

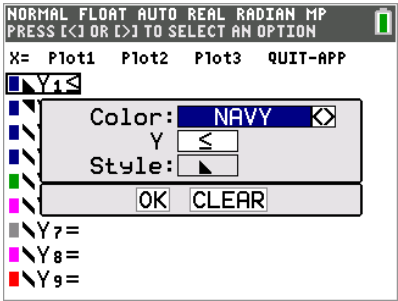


Next, turn on the Inequalities Application: **apps** Select: 5: Inequalz

Enter equations into the **stat plot f1** screen

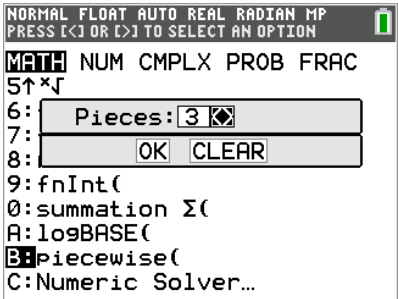
To change colors and inequality symbols: Arrow left until the desired Yx = line is outlined with a box. Press enter.
Hint: pay attention to the inequality symbols.

Use the dialogue box to select settings.



To enter multiple functions in a Yx = row, use the piecewise template: **test A** Select: B: piecewise(

Use dialogue box to select quantity of pieces per Yx = line.



For x= go to the top left corner of the functions menu and select x= to toggle between the functions

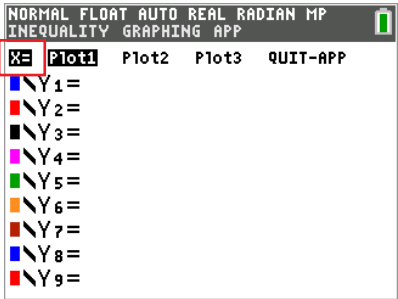


table f5 **graph** your work when all math is entered. Double check your equations.

Hat - teacher notes

Hidden image reveal: A cozy winter beanie! Share this image with your students when you see fit.

Reminders: Take note of the inequality symbols on Yx lines to get the proper shaded in areas to produce the designs.

When entering multiple functions per Yx line, use the piecewise template.

Not all of the provided graphing notes may be needed and are generalized for basic use and discovery.

Experiment! Using color, line and background settings, how could students make the image their own?

How could they alter the math to make their own designs?

