

Lesson Plan

by
Scott Drucker

Class: Math B

Time required: 1 Period

Title: Using the Ti-83 to solve absolute value inequalities

The students should have prior knowledge on how to solve absolute value inequalities algebraically. They should also know how to find the intersection of two functions using the Intersection Key. They will use this technique to solve and check their algebraic solutions.

Ex. Solve: $|x + 2| > 5$

Step 1: Type into y_1 the left side of the inequality.

Note: The absolute value symbol is found at Math, NUM 1 or 2nd Catalog.

```
Plot1 Plot2 Plot3
\Y1=abs(X+2)
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

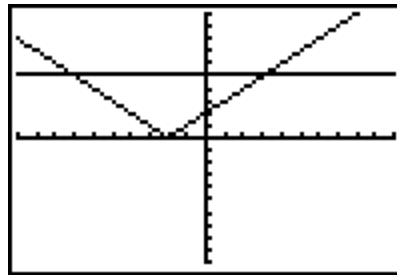
Step 2: Type into y_2 the right side of the inequality.

```
Plot1 Plot2 Plot3
\Y1=abs(X+2)
\Y2=5
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

Step 3: Graph using Zoom Standard and adjust the window if necessary.

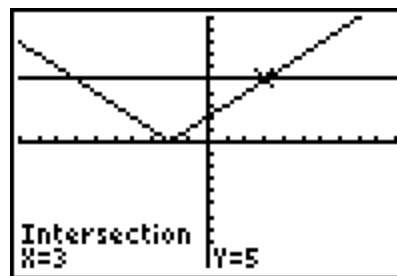
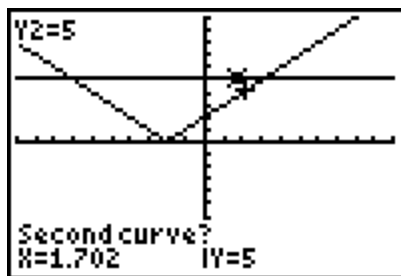
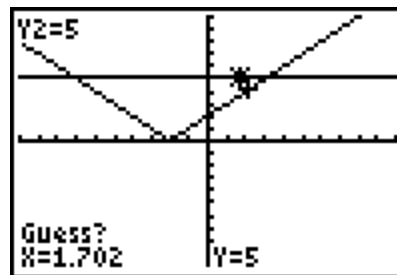
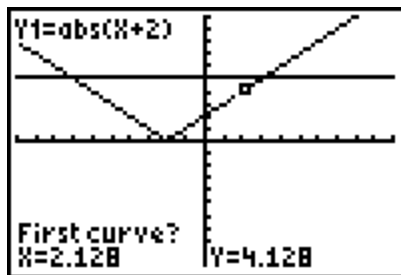
```

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

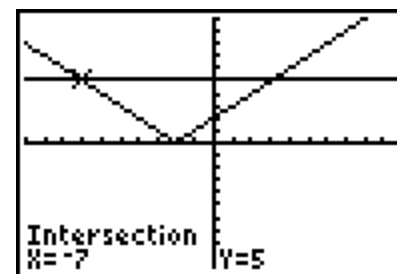
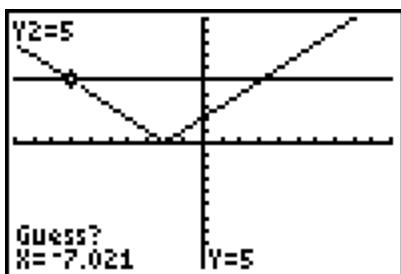


Note: If the horizontal line intersects the absolute value graph then make sure you can see the points of intersection.

Step 5: Use the Intersection Key (2nd trace, intersect) to find all points of intersection



Repeat the above procedure to find the other point of intersection:



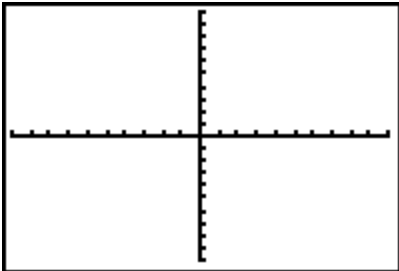
The calculation for intersection must be applied twice in-order to find both points. Be sure the move the cursor close to each intersection point.

We may write our solution to the inequality by noting that the absolute value graph has values greater than the line $y = 5$ when it is above it. That occurs for values of x that are to the left of -7 and to the right of 3 . Thus the solution is the union of the two sets $x < -7$ or $x > 3$.

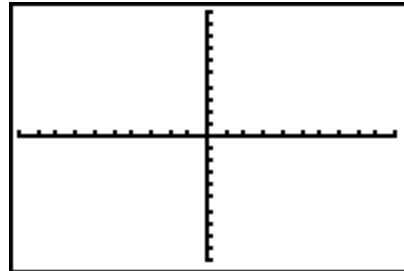
Exercises:

- Graph and sketch on the grid provided
- Indicate the solution set with a statement of inequality
- Justify your answer algebraically

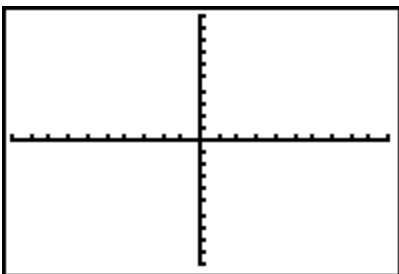
1. $|2x - 3| > 5$



2. $|3x - 4| < 7$



3. $|x + 3| > -5$



4. $|x + 3| < -5$

