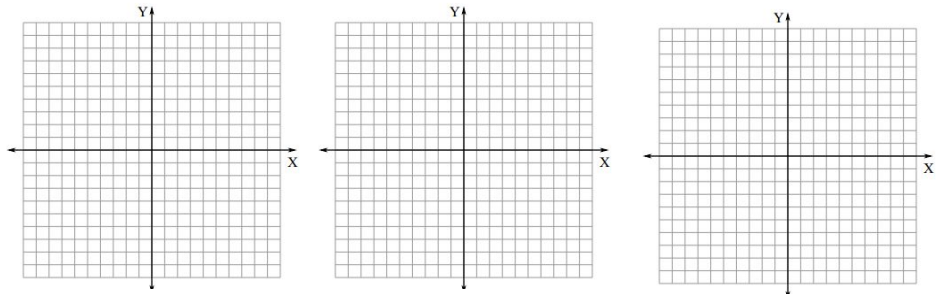


SM2 A2-2.Solving & Graphing Absolute Value Functions

1. What are the possible situations for solutions when solving absolute value equations? Sketch them on the graphs to the right.



2. Graph the following equations:

$$y = 2|x + 1|$$

$$y = 6$$

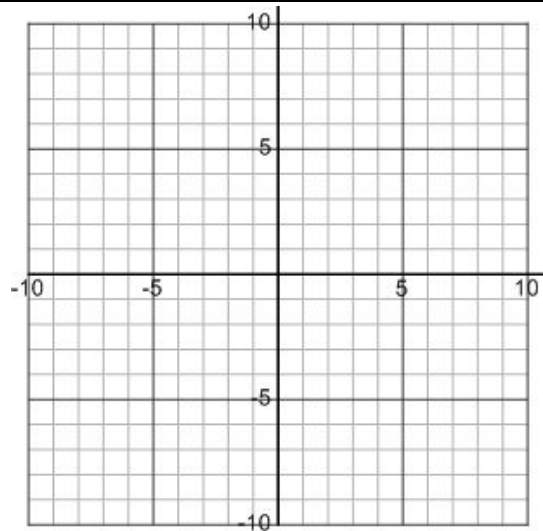
Where do the lines cross?

3. Now, solve the equation for x:

$$2|x + 1| = 6$$

Do your answers match?

How many solutions are there?



4. Graph the following equations:

$$y = \frac{1}{2}|x - 3| + 2$$

$$y = -2$$

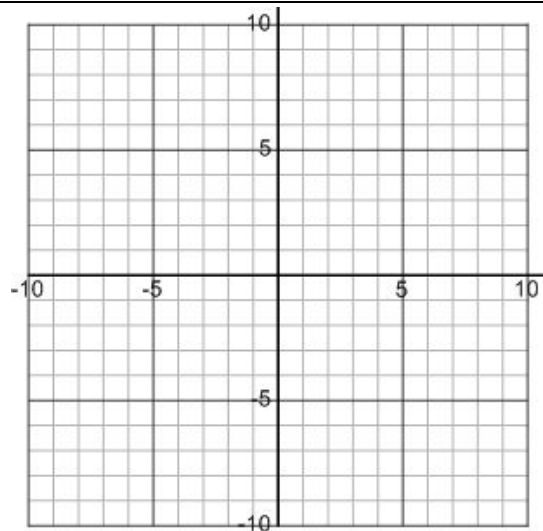
Where do the lines cross?

5. Now, solve the equation for x:

$$\frac{1}{2}|x - 3| + 2 = -2$$

Do your answers match?

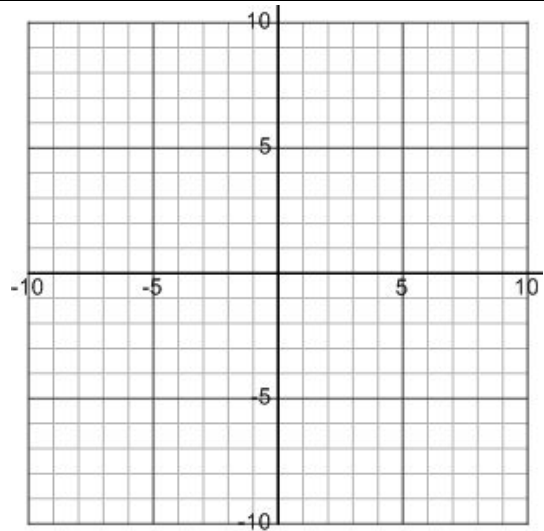
How many solutions are there?



6. Solve the following algebraically and graphically (use the graph to the right).

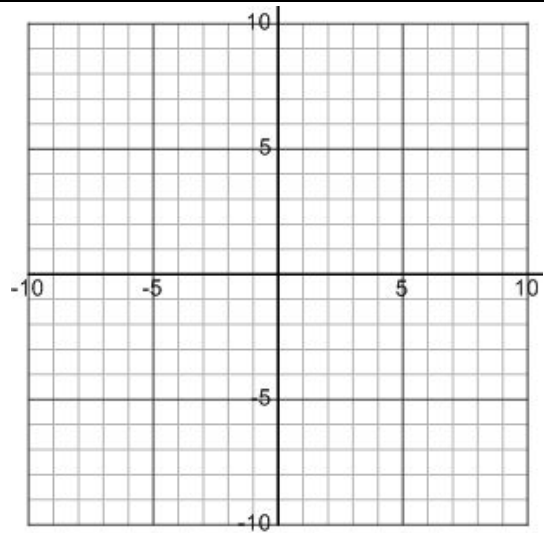
$$-2|x - 1| + 4 = 4$$

How many solutions are there?



7. Solve the following algebraically and graphically (use the graph to the right).

$$-\frac{1}{2}|x| + 1 = -3$$



8. Graph the following equation on your graphing calculator. Sketch what you graph on your calculator below.

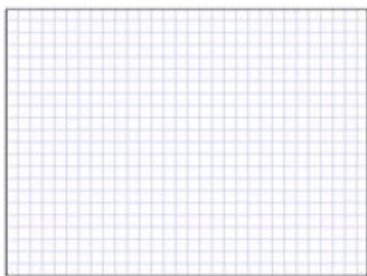
$$|4x + 8| - 2 = 6$$

What are the solutions?

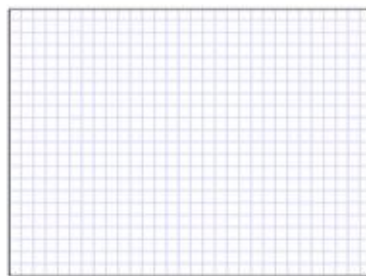
9. Graph the following equation on your graphing calculator. Sketch what you graph on your calculator below.

$$-|2x + 3| - 5 = 7$$

What are the solutions?



Window x:[,] y:[,]



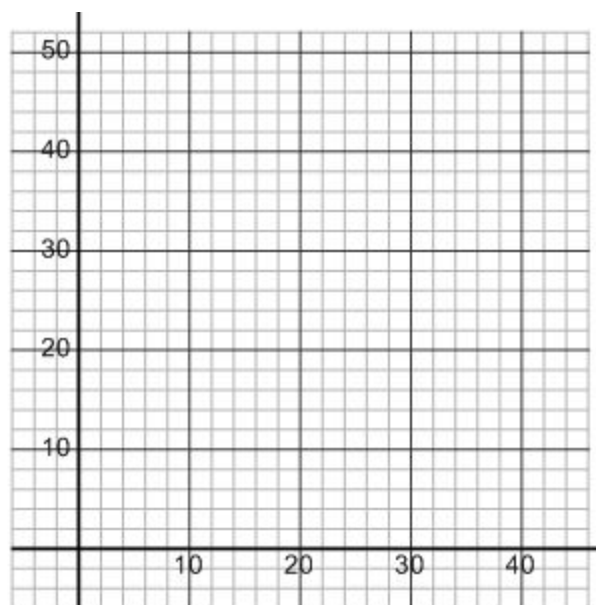
Window x:[,] y:[,]

Weekly sales for a fundraiser increase steadily, then decrease. This is the function that represents the sales: $s = -2|t - 20| + 40$ where s is the sale amount (in dollars), and t is the time (in weeks).

10. At what week is the fundraiser's sales at \$20? Find the solution algebraically and graphically (use the graph to the right).

11. Did the fundraiser ever make a weekly sale of \$50?

12. What is the maximum weekly sale of the fundraiser?



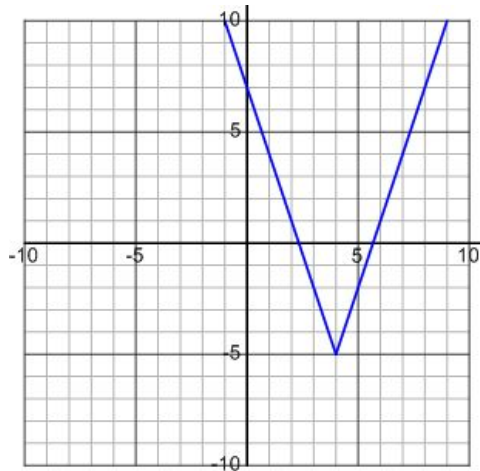
13. Describe the transformation from $f(x) = |x|$ to $-3f(x) - 2$

14. Describe the transformation from the graph

$f(x) = x$ to the graph $\frac{1}{2}f(x - 6)$

Now graph **both equations**, showing the transformation from $f(x) = x$ to the graph $\frac{1}{2}f(x - 6)$

15. Find the following from the graph below:



Equation of this Graph:

Domain:

Range:

End Behavior:

Increasing Interval:

Decreasing Interval:

16. Write the equation of a line in **Slope-Intercept Form** that goes through the points: (2, 4) and (-2, 6).

17. Find an equation of the line with slope of 5 and an **x-intercept** of (4, 0).

18. Joe owes his father \$21. He decides he will pay his dad back \$3 each week, in order to be out of debt in 7 weeks.

Label each description as the slope, x-intercept, y-intercept, or none.

- He pays back \$3 each week _____
- He has a debt of \$21 _____
- He will be out of debt in 7 weeks _____
- He will have \$6 of debt in 5 weeks _____

19. Match the graphs with the correct function notation.

A graph of a function f is given. Match each equation with one of the graphs labeled I–IV.

- (a) $f(x) + 2$ (b) $f(x + 3)$
(c) $f(x - 2)$ (d) $f(x) - 4$

