

Pre-Calculus
Introduction to Graphing Piece wise Functions

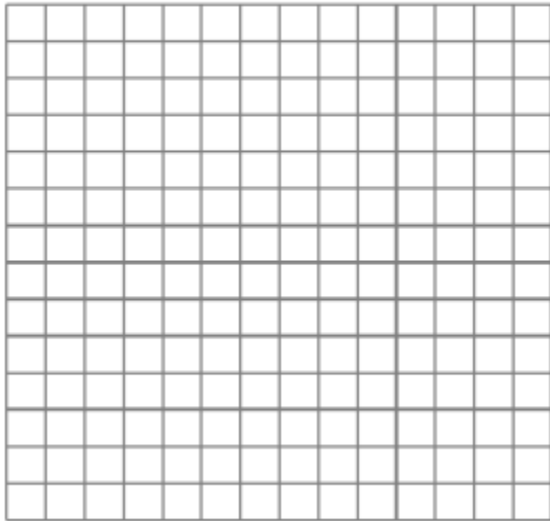
Name _____

Hour _____

In previous lessons you have evaluate and written piecewise-defined functions. In this exploration you will determine how to graph a piecewise function by hand.

Login to Desmos Graphing Calculator application (www.desmos.com) Remember to use you school Google account.

1. Graph the function $y = 2x^2 - 4$ sketch the graph on the grid below.

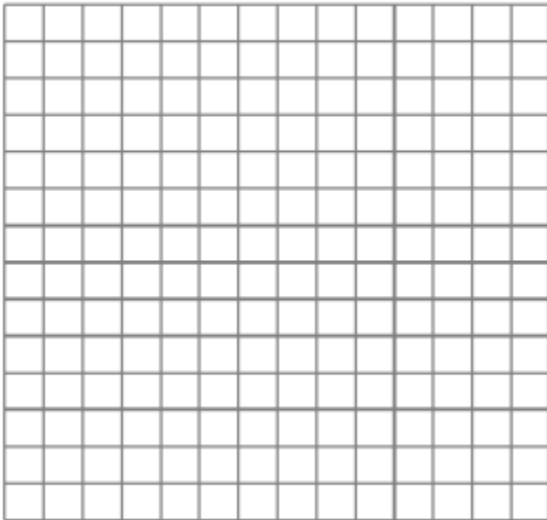


2. Now change the function to $y = 2x^2 - 4 \{x > 0\}$. How is the graph different? Why did the graph change?
3. Trace over the graph until you get to the left end of the graph (called the left endpoint). What does the program say the value of the equation is at $x=0$? What kind of point is shown?
4. Change the equation to $y = 2x^2 - 4 \{x \geq 0\}$. How is this graph different than the graph in problem 2? What kind of point is shown?
5. Why are the values different at $x=0$ in questions 3 and 4?
6. Change the equation one more time to $y = 2x^2 - 4 \{-1 < x \leq 2\}$? Explain what is being graphed. What happens at the endpoints of the graph?

7. Clear all your functions so we can graph a piecewise-defined function. When we graph the function we need to have the entire function on one graph. Look at the function below and explain how you will graph this function using Desmos.

$$f(x) = \begin{cases} \sqrt{x}, & x \geq 2 \\ x^3, & -1 \leq x < 2 \\ -x^2 + 1, & x < -1 \end{cases}$$

8. Try your idea so see if it will work. If it doesn't work try something else. Sketch the graph of $f(x)$ on the grid below.



9. Now that you have graphed using the Desmos Application, explain how you can graph $f(x)$ without technology.

10. There are ways to graph these on your TI-84 plus graphing calculator. If you would like to know how, start a "Google" search.