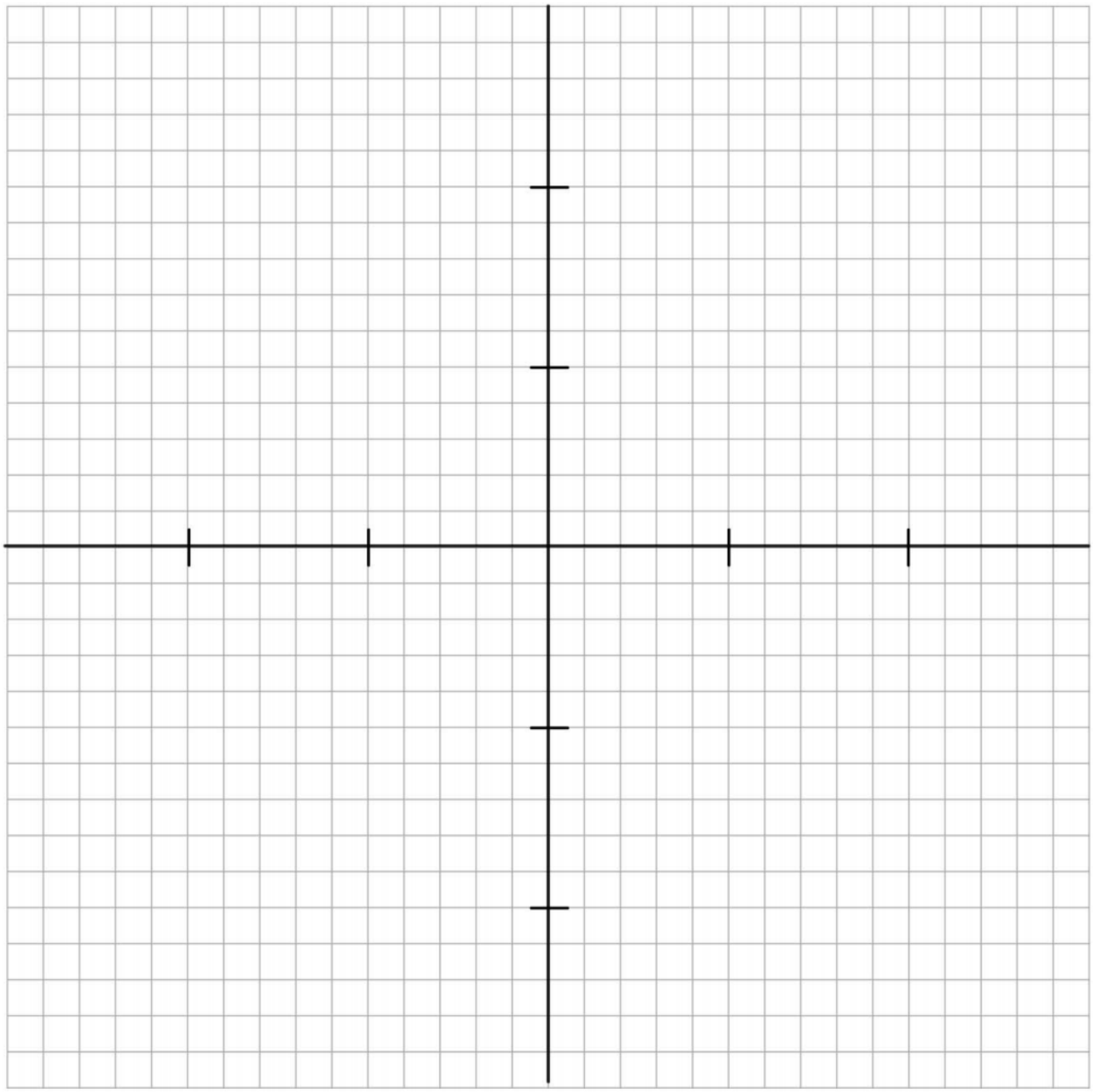
Name _____

DESMOS GRAPHING PROJECT	Hey, students!
Use this page to take notes as we explore how to "draw" with lines and curves on the DESMOS graphing calculator.	Go to student.desmos.com and type in: << enter Desmos activity code here>>

Types of graphs that are helpful in creating artwork in Desmos.

Points	LInes
Quadratics 1	Quadratics 2
Absolute Value Equations	Square Root Equations
Circles	Ellipses

Draw a rough draft of your project here.



Teacher Notes:

Prior knowledge

I introduced this project after we had completed our Geometry Transformations Unit, so the students already had an understanding of how points/polygons could move around the coordinate plane. We had used Desmos to plot a polygon and "transform" it by translation, reflection and dilation. This really helped set the students up for success with this project.

The students had studied linear, quadratic, absolute value and square root equations in Algebra I, but not specifically transformations with these equations.

The lesson

I projected Desmos on my screen and we started the lesson with drawing a rectangle with vertical and horizontal equations and I showed them how to restrict the value of x to only show portions of the line. Then I challenged them to make a non-horizontal/non-vertical rectangle with linear equations. This was a great discussion of perpendicular lines and the intersection of the equations to help with the restrictions. By this point, they were hooked!

I then asked what would happen if I took the equation y=x and square the x. Most knew it would make a parabola. We then experimented with changing values of h and k to move the equation around: y=a(x-h)^2+k. I didn't specifically give them this formula (yet), but kept changing parts and asking them how it changed. Once they figured out how changing the variables affected the graph, we wrote the formula in the Quadratics 1 square on the grid. We then squared the y and not the x to see what happened. They enjoyed making predictions of what would happen.

I think I jumped to circles next by squaring both the x and y. They loved figuring out this formula! To make elliptical graphs, we added values in front of the (x-h) and or (y-k) instead of using the traditional ellipse formula.

We then looked at absolute value equations and quickly covered square root equations. With the use of parabolas and restrictions on the domain and range, they were able to make curves without this equation.

The project

Honestly, at this point I showed them the Desmos activity and said "go for it!" They couldn't wait to get started.

Desmos Activity Link

https://teacher.desmos.com/activitybuilder/custom/5f77627a77a8600c0969264a

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Points	LInes
(x , y)	$y = mx + b$
Quadratics 1 $y - k = a(x - h)^2$ **I decided to keep the "k" with the y for now so that they would see the effect of k on the vertical shift.	**Quadratics 2** $x - h = a(y - k)^2$
Absolute Value Equations $y - k = a \lvert x - h \rvert$	**Square Root Equations** $y - k = a\sqrt{x - h}$
Circles $(x - h)^2 + (y - k)^2 = r^2$	**Ellipses** $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$