Spooky Cat Activities – Teacher notes

In this differentiated activity, students will use their knowledge of functions and limited domains to do one of the following:

» Write equations to create the given cat face .

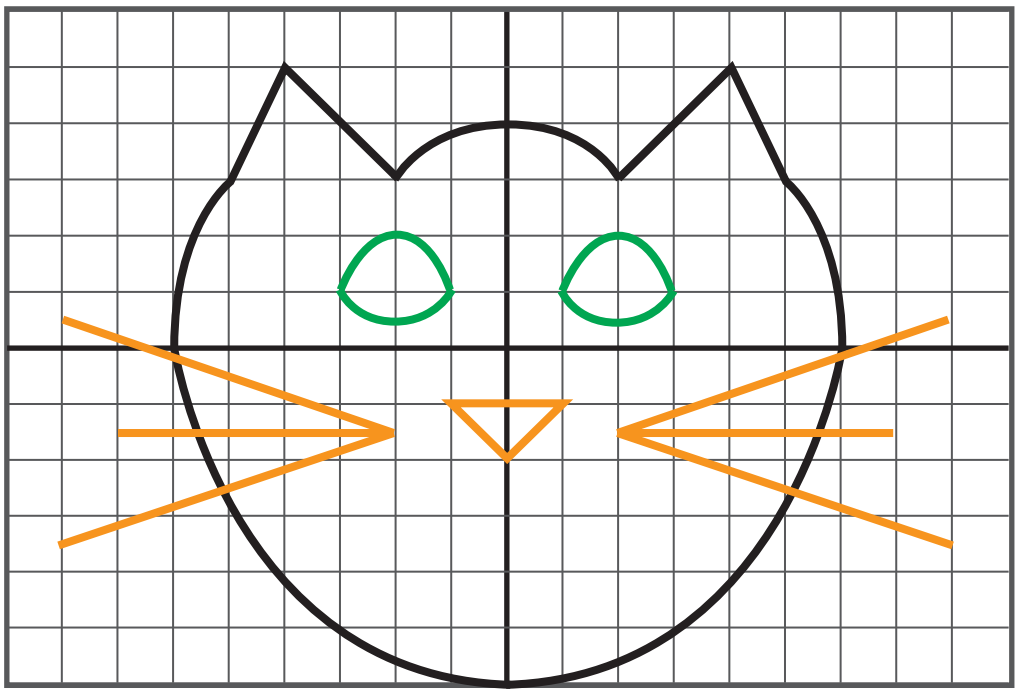
» Use their knowledge of transformations to produce the rest of the face.

» Make their own cat face and write the corresponding equations.

Common Core Standards:

» CCSS.HSF.BF.B.3

» CCSS.HSF.IF.C





ACTIVITIES AND THEIR OBJECTIVES

Spooky Cat Functions

At the end of this activity students should be able to:

» Write equations from a graph.

» Identify the domain of each equation (identify the domains in each piecewise function).

Unfinished Transformation

At the end of this activity students should be able to:

» Use properties of function transformations to write the equations for the missing pieces of the cat face.

For this activity, use personal discretion on whether to share some, all, or none of the equations to students.

Calculating Cats

At the end of this activity students should be able to:

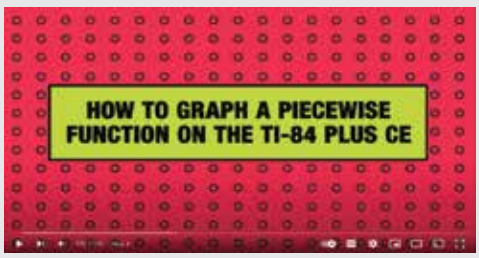
» Use their extensive knowledge of functions to write equations to create a unique graph of a cat face.

» Identify the domain of each equation (identify the domains for each piecewise function).

Introduction to piecewise functions

For these activities, students will need to know how to enter piecewise functions into their calculators.

You can play this quick how-to video for your class. **https://bit.ly/3SCT1fq**



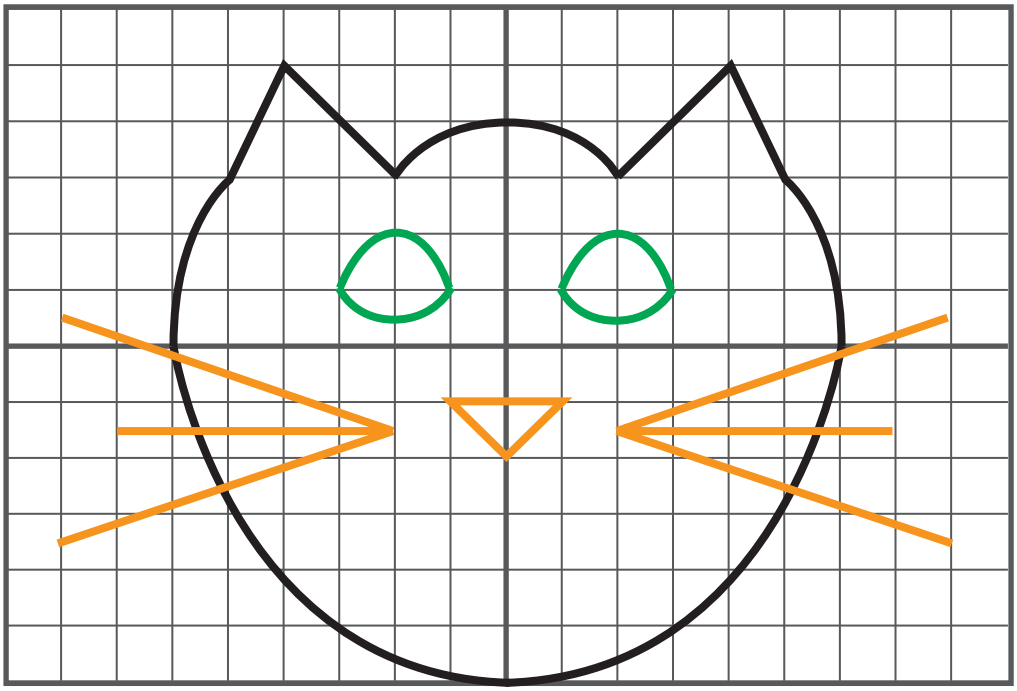
Spooky Cat Functions – Teacher notes

black	$y =$	$-\sqrt{36-x^2}$	$-6 \le x \le 6$	chin
orange	$y =$	$0.5x - 2.5$	$2 \le x \le 8$	top whiskers and sides of nose
		$x-2$	$0 \le x \le 1$	
		$-0.5x - 2.5$	$-8 \le x \le -2$	
		$-x-2$	$-1 \le x \le 0$	
orange	$y =$	-1.5	$-7 \le x \le -2$	top of nose and middle whiskers
		-1.5	$2 \le x \le 7$	
		-1	$-1 \le x \le 1$	
orange	$y =$	$0.5x - 0.5$	$-8 \le x \le -2$	bottom whiskers
		$-0.5x - 0.5$	$2 \le x \le 8$	
black	$y =$	$-\left(\frac{x}{2}\right)^2+4$	$-2 \le x \le 2$	top of head and ears
		$x+1$	$2 < x < 4$	
		$-2x+13$	$4 \le x \le 5$	
		$-x+1$	$-4 < x < -2$	
		$2x+13$	$-5 \le x \le -4$	
black	$y =$	$-(x+4)^2+4$	$-6 \le x \le -5$	sides of face
		$-(x-4)^2+4$	$5 \le x \le 6$	
green	$y =$	$-(x+2)^2+2$	$-3 \le x \le -1$	top eyelids
		$-(x-2)^2+2$	$1 \le x \le 3$	
green	$y =$	$0.5(x+2)^2+0.5$	$-3 \le x \le -1$	bottom eyelids
		$0.5(x-2)^2+0.5$	$1 \le x \le 3$	

Name: _____ Date: _____

Spooky Cat Functions

Let's draw a spooky cat! First, determine the equations used to make this image. Try breaking down the image into the parts below. Hint: the number of functions used is indicated in the parentheses. Next, enter the equations into your calculator to visualize the equations all together!





Top of Head and Ears (5):

Top Whiskers and Sides of Nose (4):

Bottom Whiskers (2):

Top of Eyes (2):

Cheeks (2):

Top of Nose and Middle Whiskers (3):

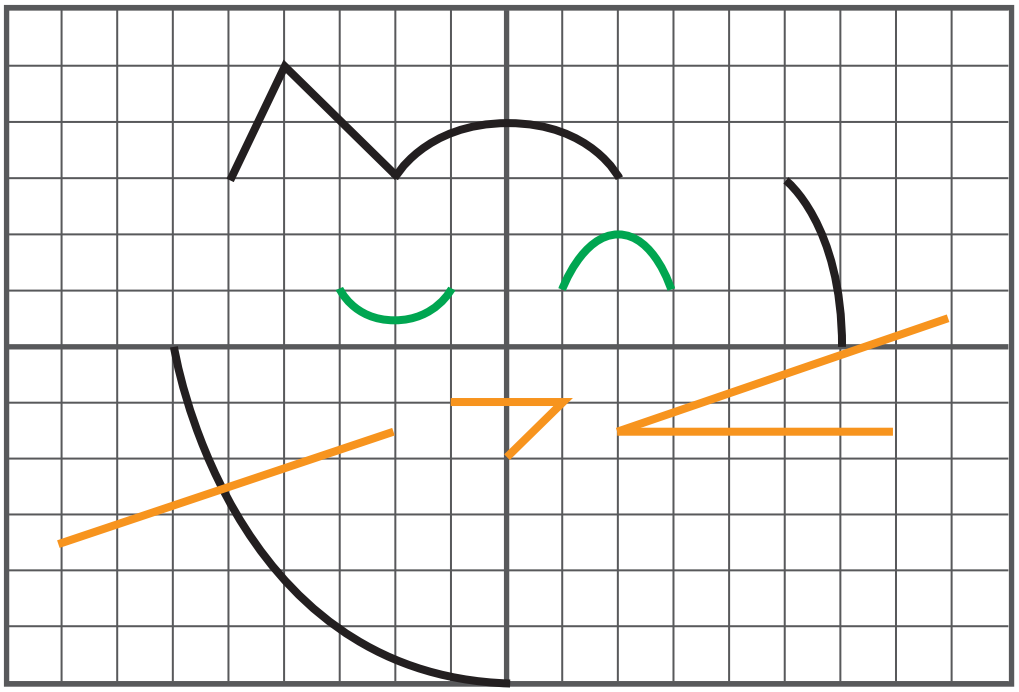
Bottom of Eyes (2):

Chin (1):

Name: _____ Date: _____

An Unfinished Transformation

This magic spell is trying to turn math into a cat, but the transformation is incomplete! Determine the equations needed to finish the picture. Next, enter the equations into your calculator to finish the transformation.





Top of Head and Ears (5):

Top Whiskers and Sides of Nose (4):

Bottom Whiskers (2):

Top of Eyes (2):

Cheeks (2):

Top of Nose and Middle Whiskers (3):

Bottom of Eyes (2):

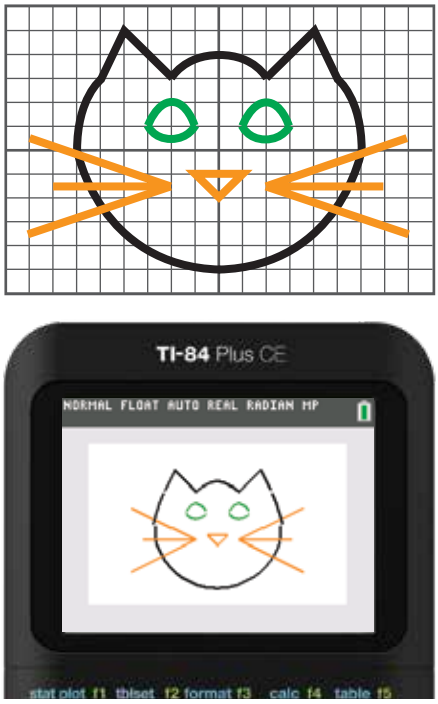
Chin (1):

Name: _____ Date: _____

Calculating Cats

Let's draw a spooky cat! First, determine the equations used to make this image. Try breaking down the image into the parts below. Next, enter the equations into your calculator to visualize the equations all together!

Example



Draw your own cat (or other animal) face

Determine your functions below. Graph them on your calculator to check your work.