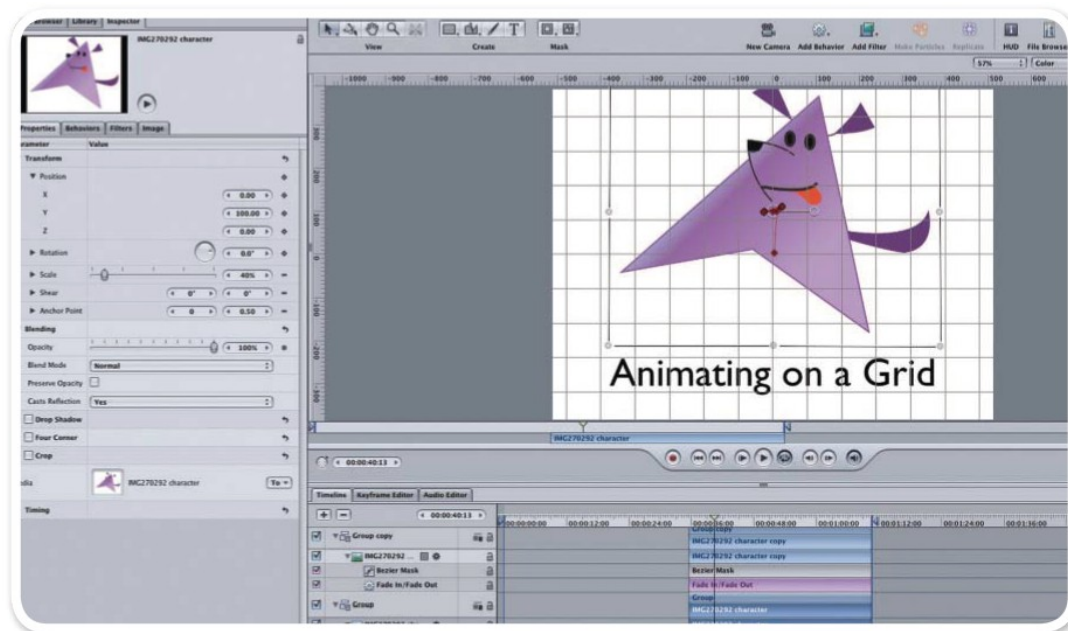


2.1 Drawing Wumps

Making Similar Figures

Zack and Marta's computer game involves a family called the Wumps. The members of the Wump family are various sizes, but they all have the same shape. That is, they are *similar*. Mug Wump is the game's main character. By enlarging or reducing Mug, a player can transform him into other Wump family members.

Zack and Marta experiment with enlarging and reducing figures on a coordinate grid. First, Zack draws Mug Wump on graph paper. Then, he labels the key points from A to X and lists the coordinates for each point. Marta writes the rules that will change Mug's size.



**Problem 2.1**

Marta tries several rules for transforming Mug into different sizes. At first glance, all the new characters look like Mug. They look like they might be mathematically similar to Mug. Some of the new characters are quite different, however. They are not mathematically similar to Mug.



- A** To draw Mug on a coordinate graph, refer to the “Mug Wump” column in the table on the next page.
- For Parts 1–3 of the figure, plot the points in order. Connect them as you go along.
 - For Part 4, plot the two points, but do not connect them.
 - When you are finished, describe Mug’s shape.
- B** Use the columns for Zug, Lug, Bug, and Glug.
1. Use the given rule to find the coordinates of the points.
For example, the rule for Zug is $(2x, 2y)$. This means that you multiply each of Mug’s coordinates by 2. Point *A* on Mug is $(0, 1)$, so the corresponding point *A* on Zug is $(0, 2)$. Point *B* on Mug is $(2, 1)$, so the corresponding point *B* on Zug is $(4, 2)$.
 2. Draw Zug, Lug, Bug, and Glug on separate coordinate planes. Plot and connect the points for each figure just as you did to draw Mug.
- C**
1. Compare the characters to Mug. Which are the impostors (*not* members of the Wump family)?
 2. What things are the same about Mug and the others?
 3. What things are different about the five characters?

A C E Homework starts on page 36.

Coordinates of Game Characters

	Mug Wump	Zug	Lug	Bug	Glug
Rule	(x, y)	$(2x, 2y)$	$(3x, y)$	$(3x, 3y)$	$(x, 3y)$
Point	Part 1				
<i>A</i>	(0, 1)	(0, 2)	■	■	■
<i>B</i>	(2, 1)	(4, 2)	■	■	■
<i>C</i>	(2, 0)	■	■	■	■
<i>D</i>	(3, 0)	■	■	■	■
<i>E</i>	(3, 1)	■	■	■	■
<i>F</i>	(5, 1)	■	■	■	■
<i>G</i>	(5, 0)	■	■	■	■
<i>H</i>	(6, 0)	■	■	■	■
<i>I</i>	(6, 1)	■	■	■	■
<i>J</i>	(8, 1)	■	■	■	■
<i>K</i>	(6, 7)	■	■	■	■
<i>L</i>	(2, 7)	■	■	■	■
<i>M</i>	(0, 1)	■	■	■	■
	Part 2 (Start Over)				
<i>N</i>	(2, 2)	■	■	■	■
<i>O</i>	(6, 2)	■	■	■	■
<i>P</i>	(6, 3)	■	■	■	■
<i>Q</i>	(2, 3)	■	■	■	■
<i>R</i>	(2, 2)	■	■	■	■
	Part 3 (Start Over)				
<i>S</i>	(3, 4)	■	■	■	■
<i>T</i>	(4, 5)	■	■	■	■
<i>U</i>	(5, 4)	■	■	■	■
<i>V</i>	(3, 4)	■	■	■	■
	Part 4 (Start Over)				
<i>W</i>	(2, 5) (make a dot)	■	■	■	■
<i>X</i>	(6, 5) (make a dot)	■	■	■	■

