

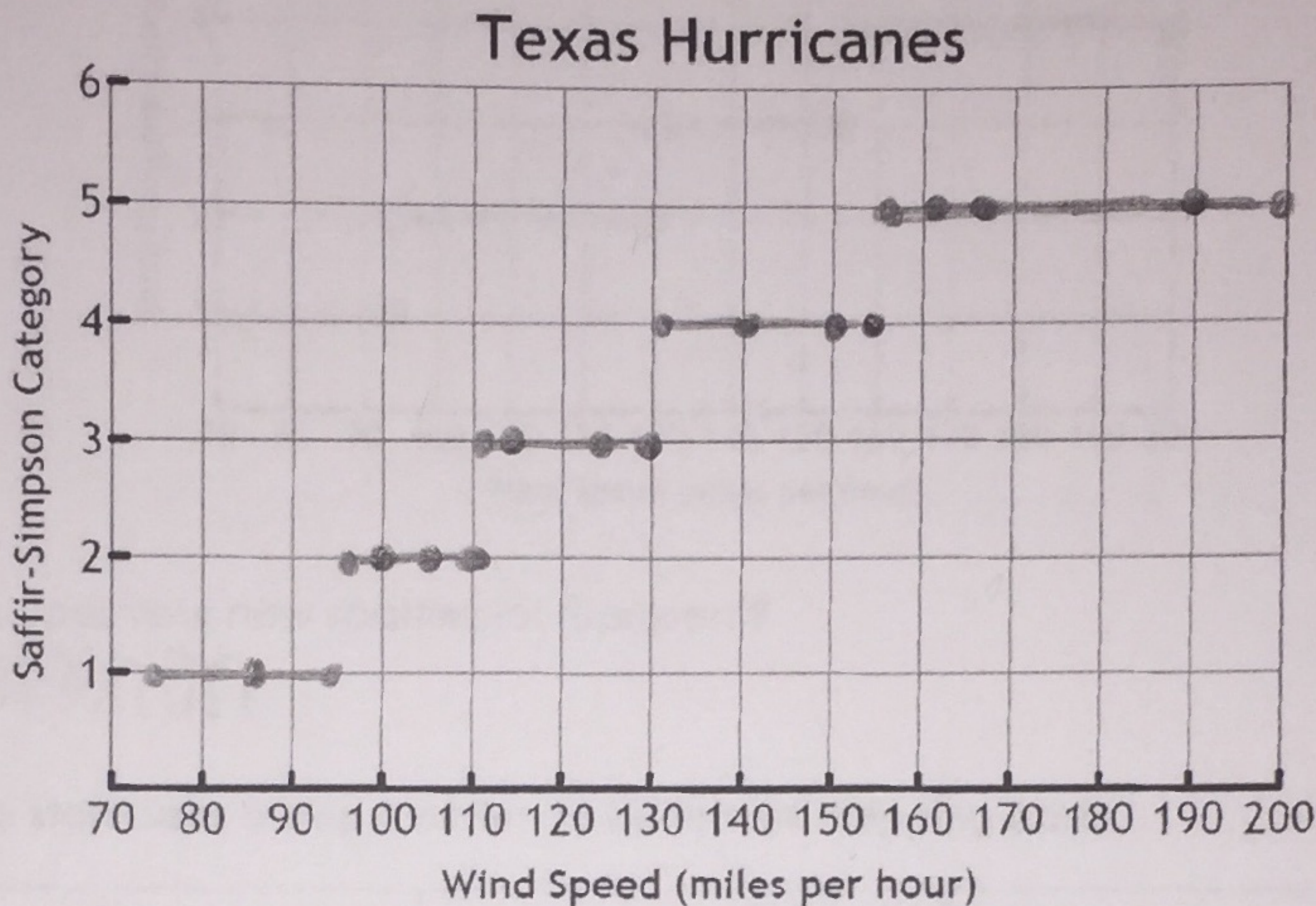
1. Write a dependency statement that describes the relationship between the two variables, wind speed and Saffir-Simpson category.

hurricane strength

Saffir-Simpson category depends on wind speed of the hurricane.

2. Make a scatterplot of the Saffir-Simpson category versus wind speed for the hurricanes listed in the table.

* need 1st 2 pages



3. Now mark the wind speed endpoints for each Saffir-Simpson category on the scatterplot. Connect those endpoints with a line segment. For example, along the line for Category 1, mark the wind speeds 74 and 95 [that is, the points (74, 1) and (95, 1)] and then connect them with a line segment.

4. Is it possible for a hurricane to be rated between Category 1 and Category 2? Why or why not?

yes. category 1 is between 74-95 and category 2 is between 96-110, so there is nothing for wind speeds between 95 & 96 mph. Hurricane wind speeds are difficult to measure precisely. Thus, most hurricane wind speeds are estimated to the nearest 5 miles per hour. Suppose a new technology was invented that allowed meteorologists to measure hurricane wind speeds very precisely.

5. If a hurricane had a wind speed of 95.1 miles per hour, what category would it be rated? How do you know?

According to the Saffir-Simpson scale, there's no way to categorize a

6. Revise the Saffir-Simpson scale so that you can rate hurricanes with wind speeds that lie between the existing categories.

Revised Saffir-Simpson Scale

Category	Wind Speed (miles per hour)
1	74 through 95
2	>95 through 110
3	>110 through 130
4	>130 through 155
5	>155

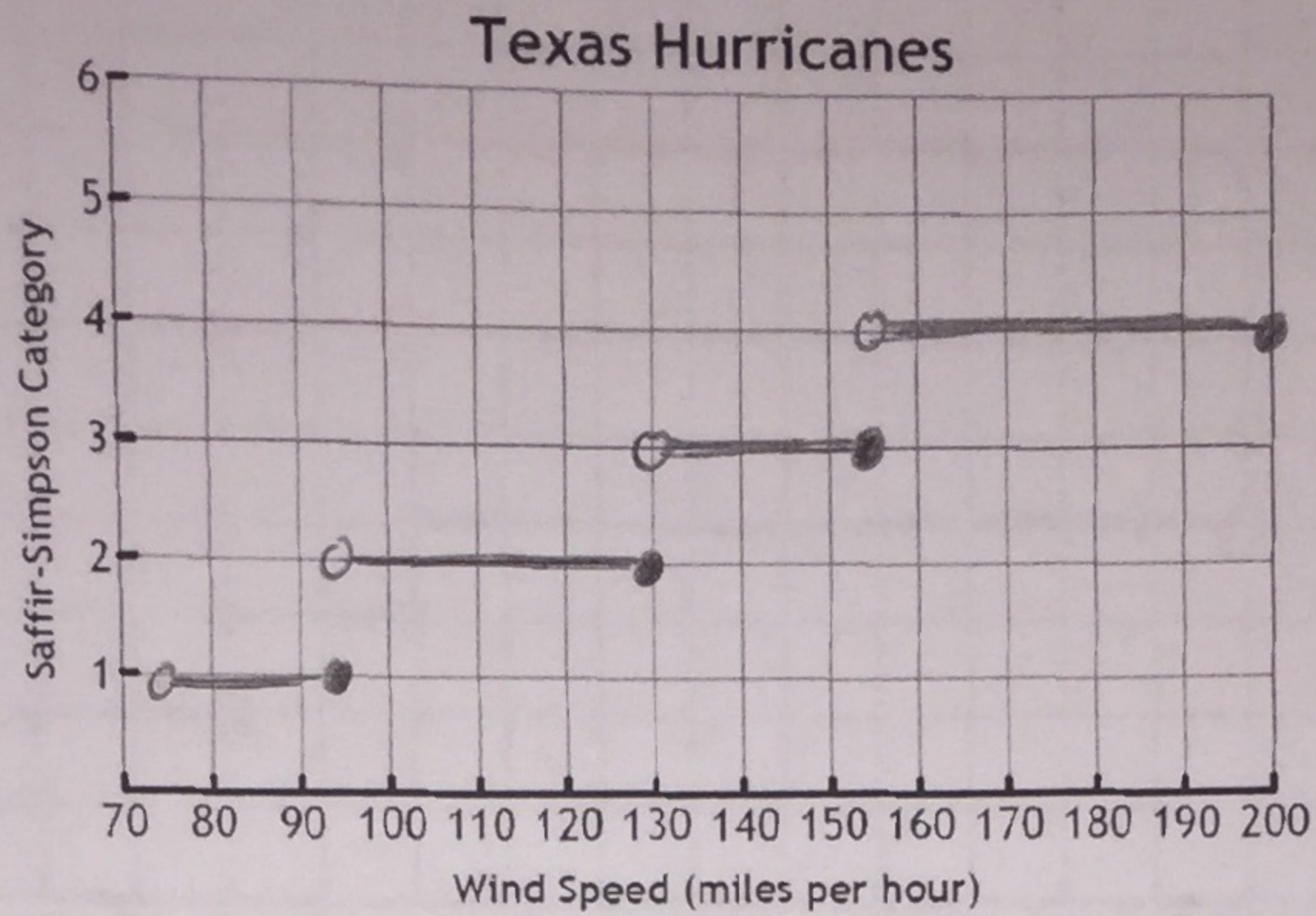
↑ greater than

hurricane with a wind speed between 95 & 96 mph.

7. When graphing inequalities, how do you represent an endpoint that does not include or equal to?

$>$ or $<$ → open circle (up to but not including)

Use a closed or open endpoint to revise your scatterplot for the new hurricane rating scale.



9. What kind of function does your new scatterplot represent?

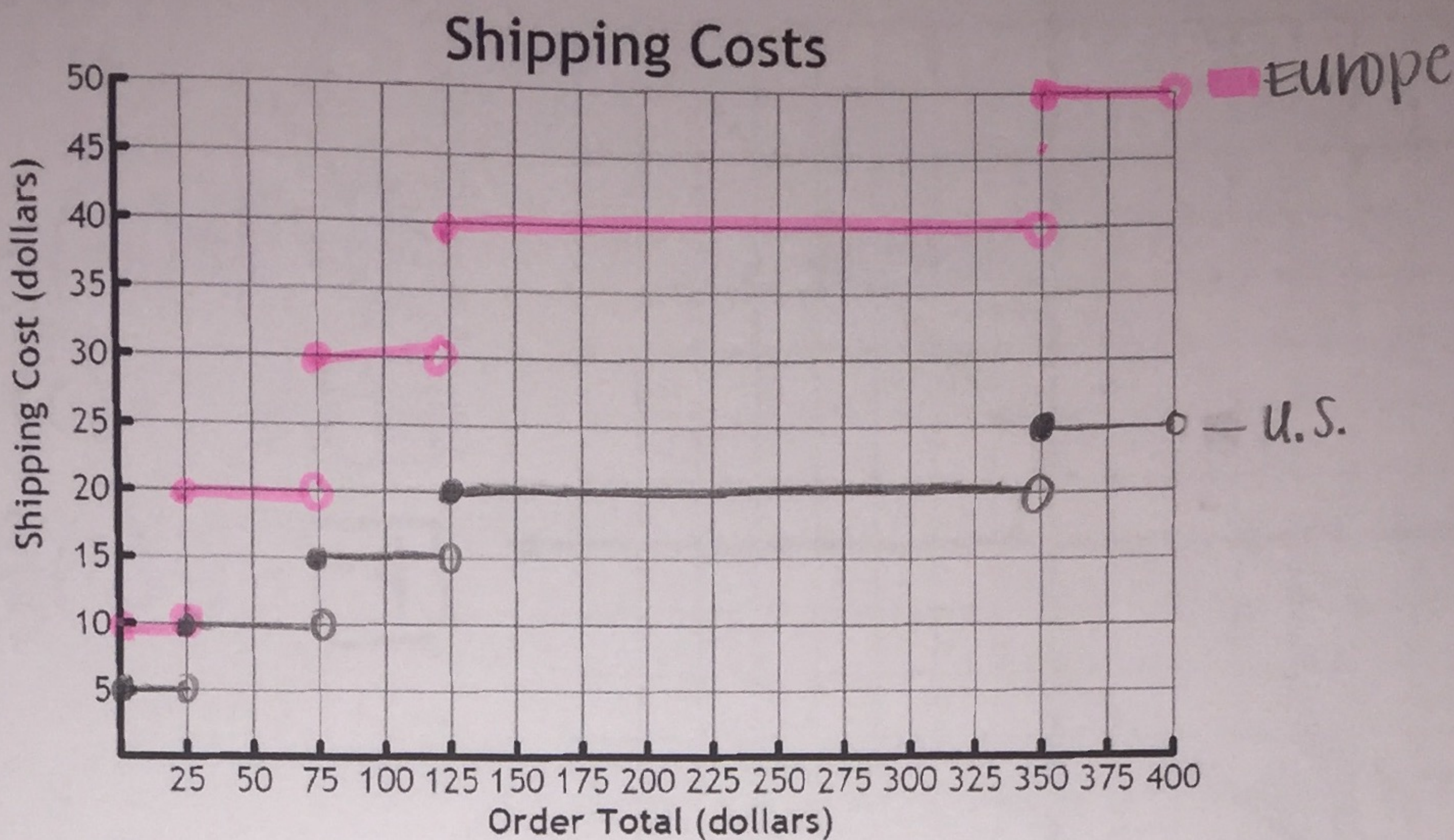
step function

10. Example 2: An online store uses a step function to determine shipping costs.

Order Total	Shipping Costs	
	Continental United States	Europe
Less than \$25	\$5.00	\$10
\$25.00 - \$74.99	\$10.00	\$20
\$75.00 - \$124.99	\$15.00	\$30
\$125.00 - \$349.99	\$20.00	\$40
\$350.00 and greater	\$25.00	\$50

11. For orders shipped to Europe, the shipping cost for the United States is doubled. Fill in the table to show the shipping costs to Europe.

12. Use a colored pencil to make a graph of shipping costs versus the order total. Use a different colored pencil to make a graph of the shipping costs to United States and Europe versus the order total.



13. How do the two graphs compare?

the horizontal segments are parallel. Each successive Europe segment is twice as far from the x-axis than the U.S. segment.

4. REFLECTION: How do step functions compare to linear functions?

step functions - create several horizontal lines that are constant over a specific domain. Linear functions are continuous, but

15. REFLECTION: How is multiplying a step function by a constant multiplier similar to multiplying the slope of a linear function by a constant multiplier?

the multiplier changes the slope, resulting in a vertical stretch (steeper slope) for linear functions. step functions are not.
 for step functions, the multiplier vertically stretches or shrinks the "steps."

or shrink!