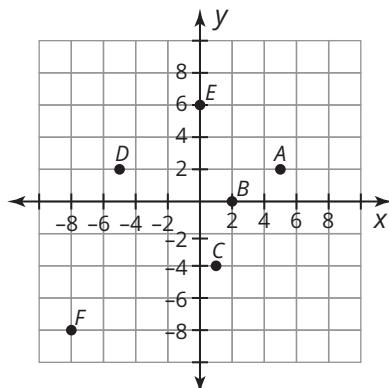


A Sort of Sorts

Analyzing and Sorting Graphs

Warm Up

Write the coordinates of each point and name the quadrant or axis where the point is located.



Learning Goals

- Review and analyze graphs and graphical behavior.
- Determine similarities and differences among various graphs.
- Sort graphs and give reasons for the similarities and differences between the groups of graphs.

Let's Sort Some Graphs

Mathematics is the science of patterns and relationships. Looking for patterns and sorting patterns into different groups based on similarities and differences can provide valuable insights. In this lesson, you will analyze many different graphs and sort them into various groups.

- 1. Cut out the 19 graphs at the end of the lesson. Then analyze and sort the graphs into at least 2 different groups. You may group the graphs in any way you feel is appropriate.**

Record the following information for each of your groups.

- Name each group of graphs.**
- List the letters of the graphs in each group.**
- Provide a rationale for why you created each group.**

Keep your graphs, you will need them in the next lesson.

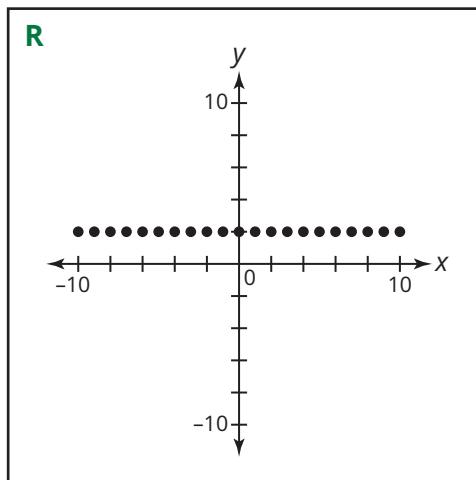
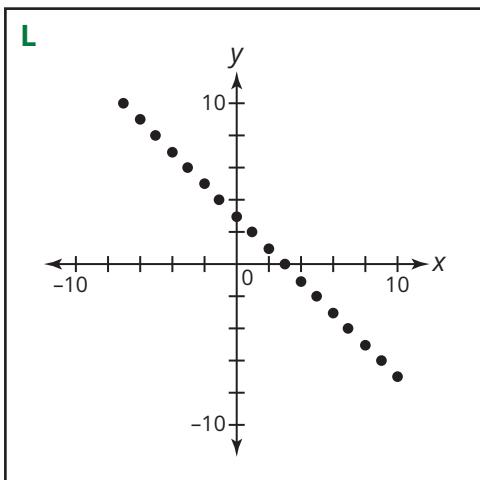
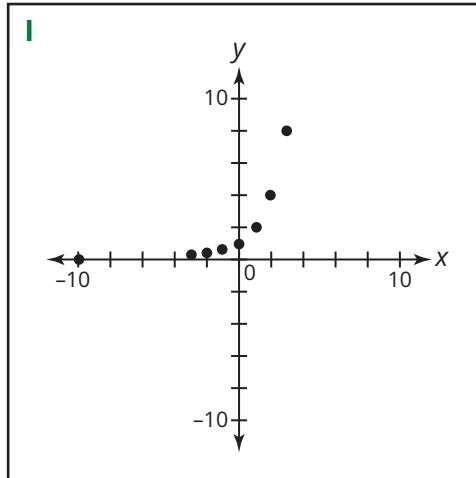
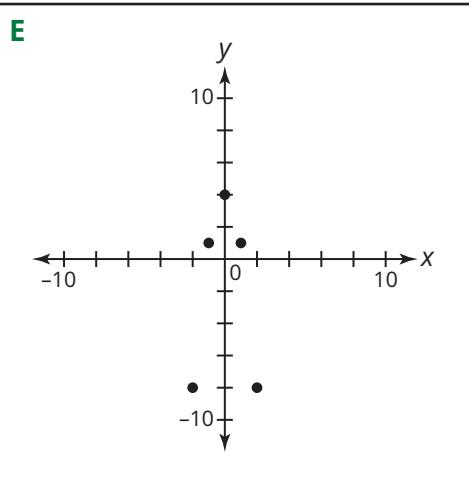
ACTIVITY
2.1

Identifying Graphical Behaviors



In this activity, consider the different ways the graphs are grouped.

- 1. Matthew grouped these graphs together. Why do you think Matthew put these graphs in the same group?**

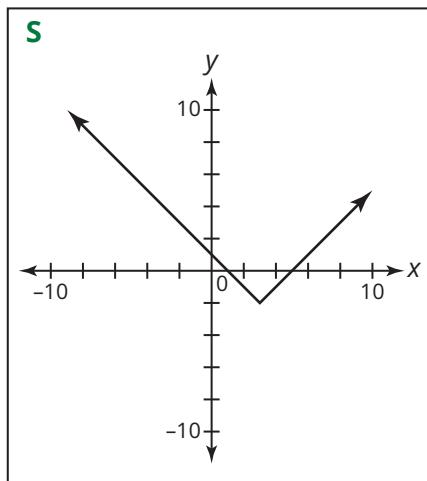
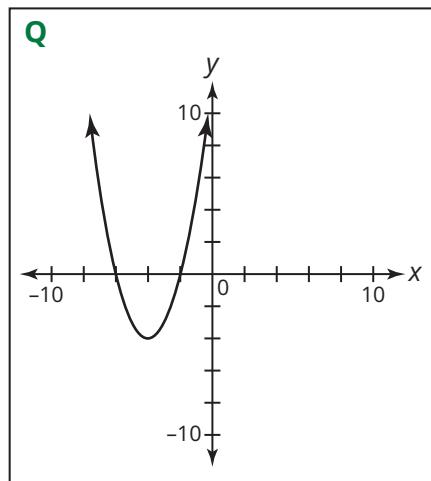
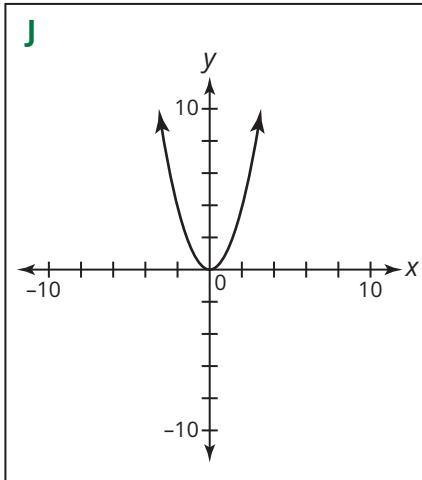
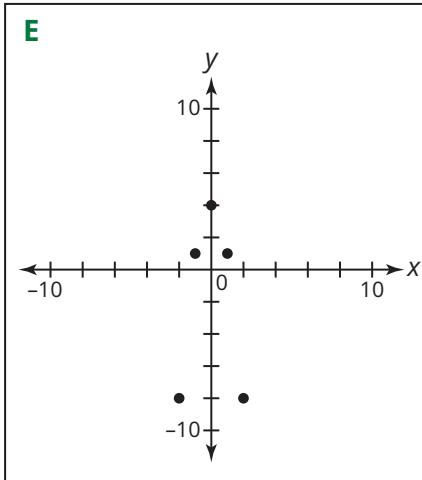
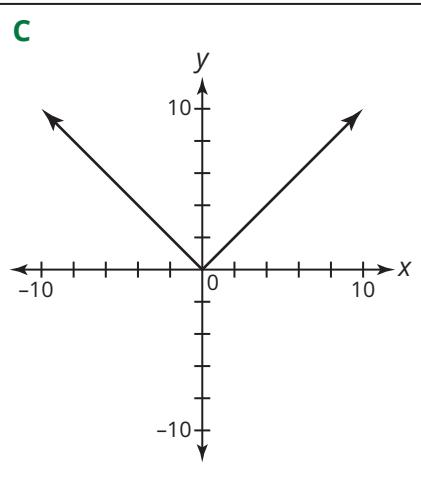


2. Consider Ashley's correct grouping.

Ashley



I grouped these graphs together because they all have a vertical axis of symmetry. If I draw a vertical line through the middle of the graph, the image is the same on both sides.



a. Show why Ashley's reasoning is correct.

b. If possible, identify other graphs that have a vertical axis of symmetry.

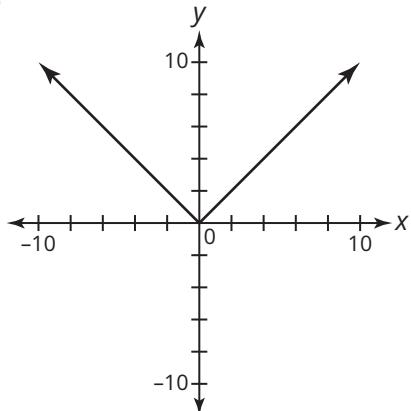
3. Consider Duane's incorrect grouping.

Duane

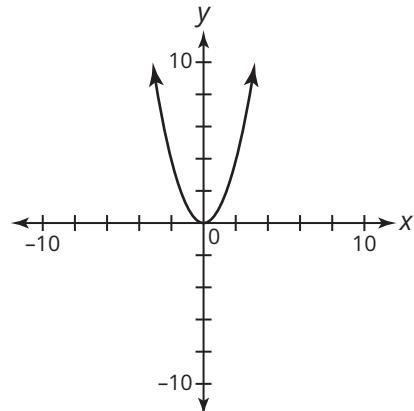
I grouped these graphs together because each graph goes through only two quadrants.



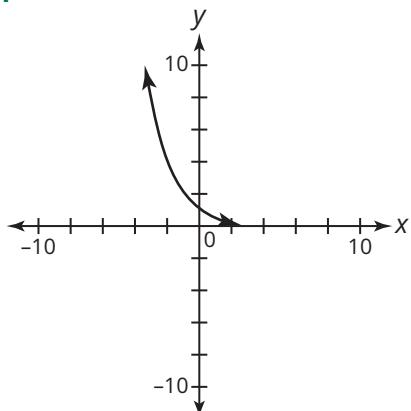
C



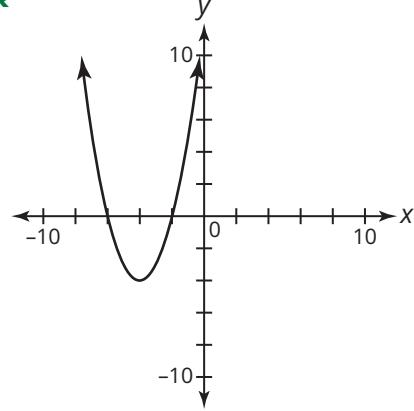
J



M



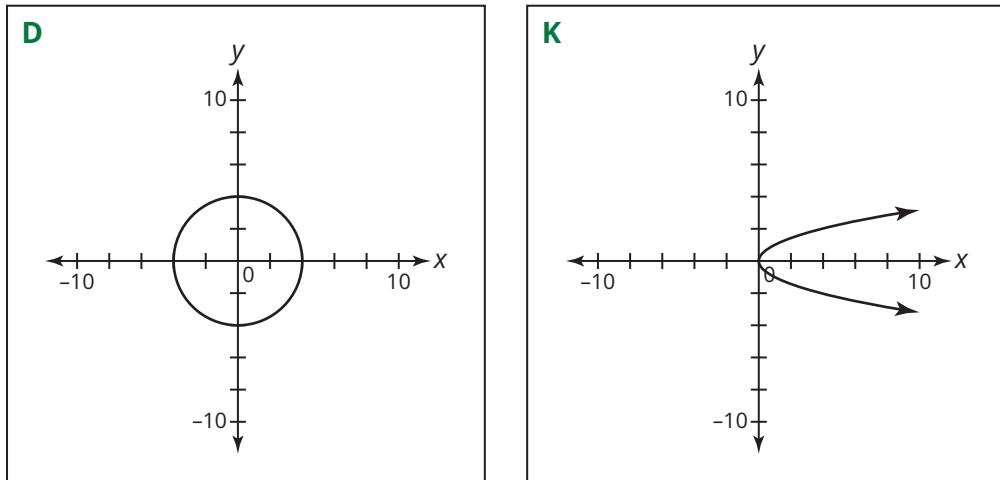
Q



a. Explain why Duane's reasoning is not correct.

b. If possible, identify other graphs that go through only two quadrants.

4. Judy grouped these graphs together, but did not provide any rationale.



a. What do you notice about the graphs?

b. What rationale could Judy have provided?

TALK the TALK



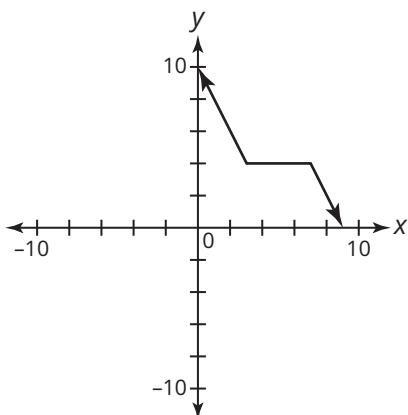
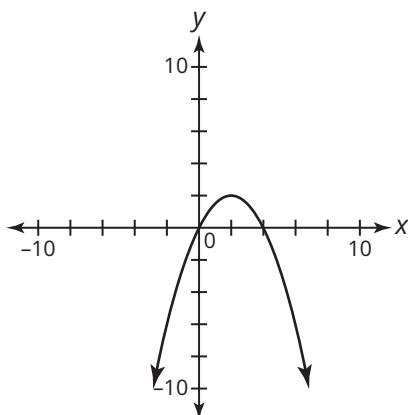
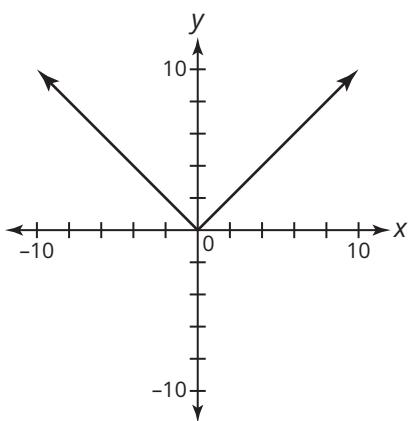
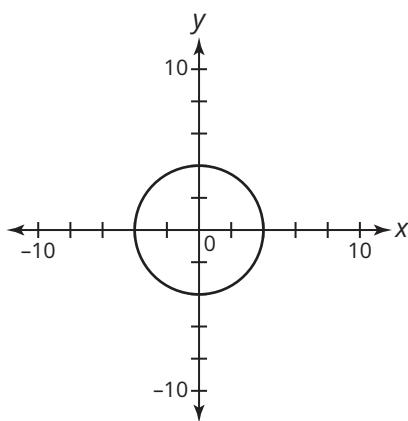
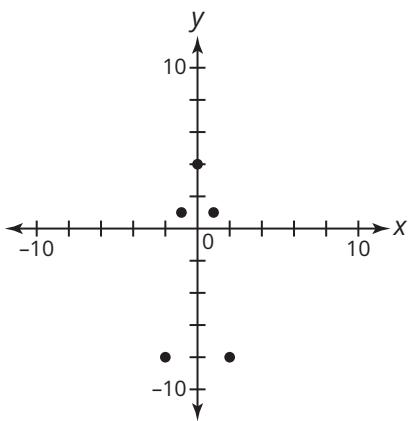
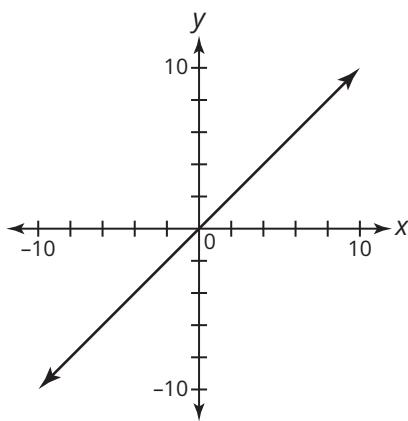
Compare and Contrast

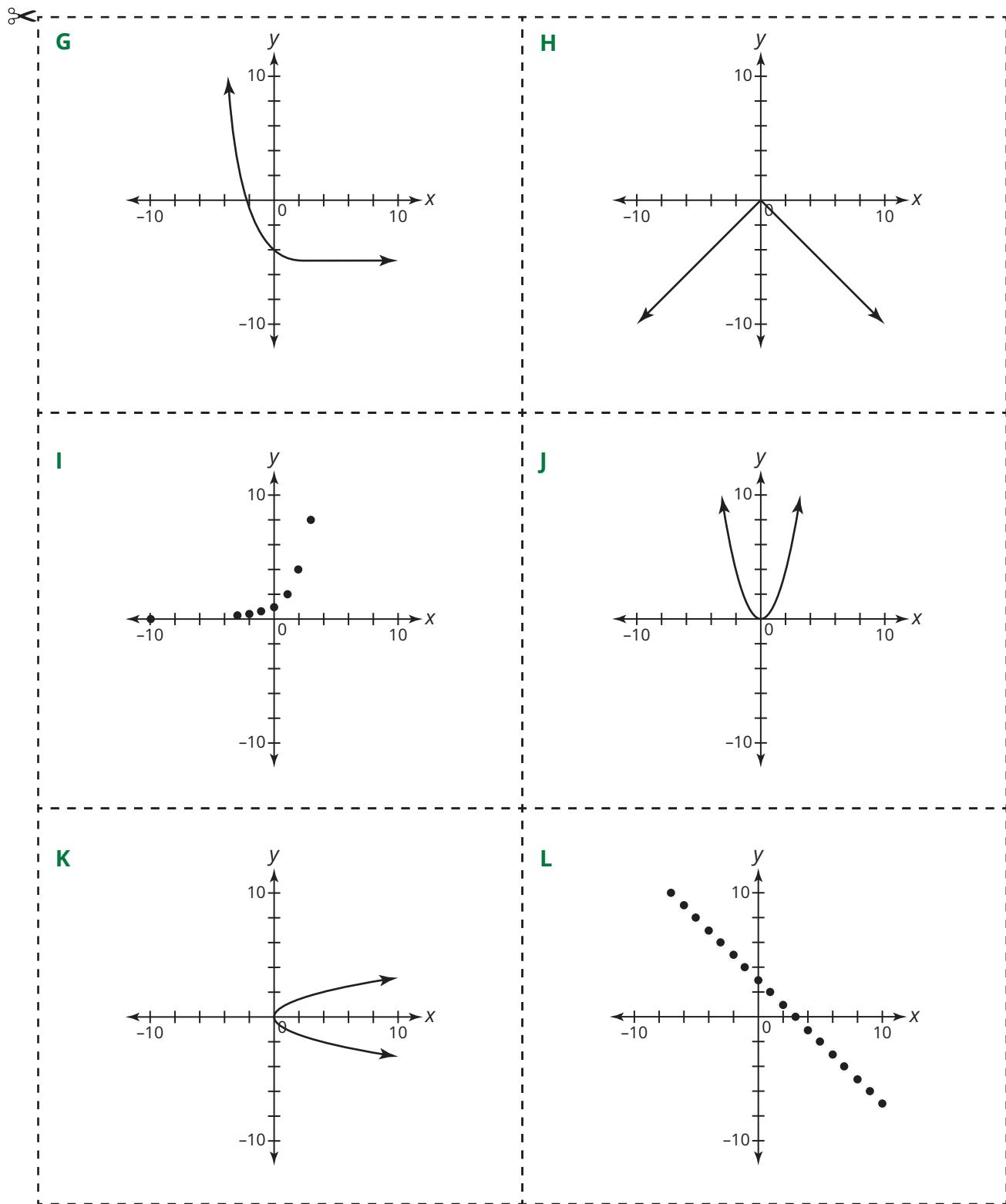
1. Compare your groups with your classmates' groups. Create a list of the different graphical behaviors you noticed.

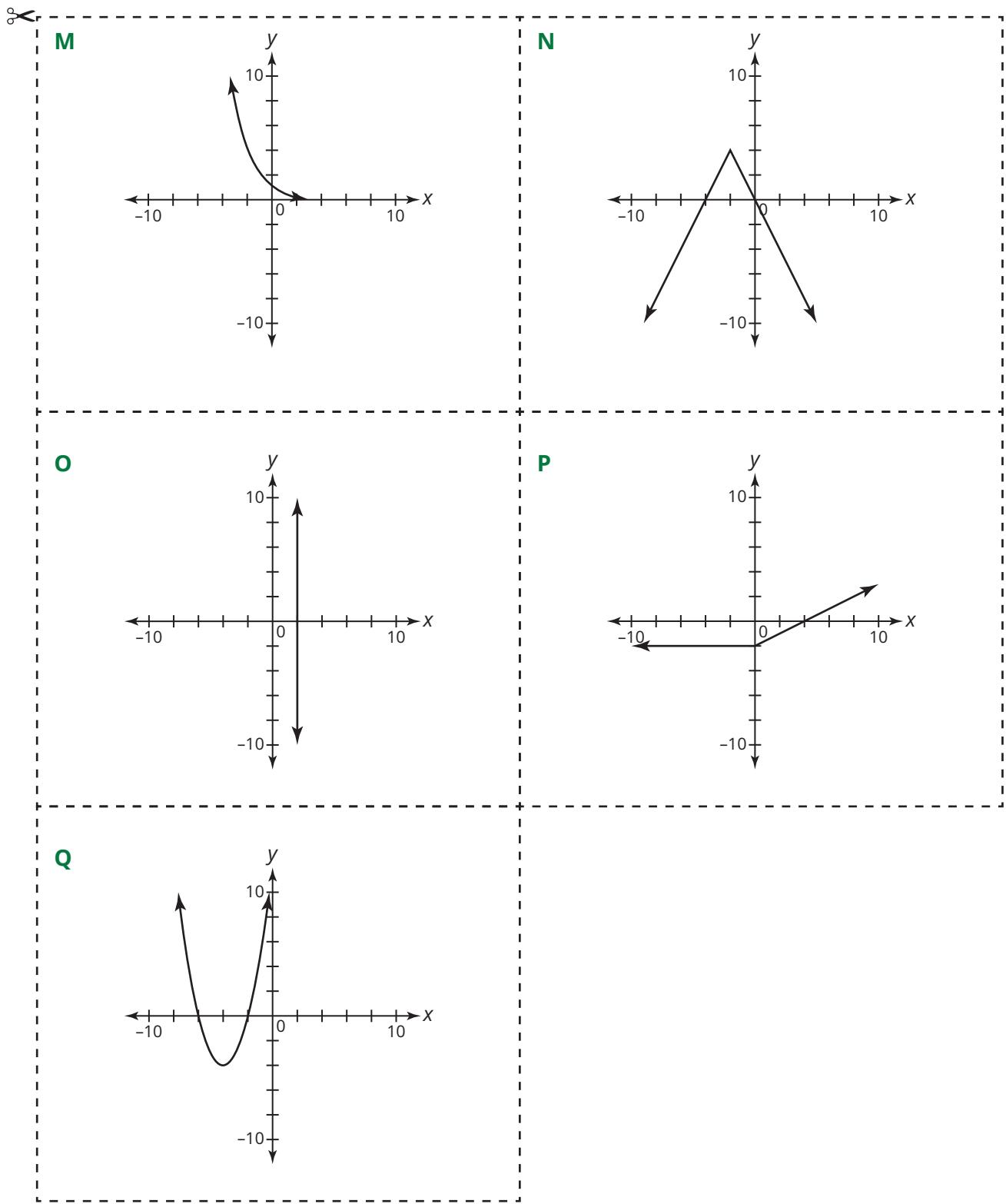
Ask
yourself:

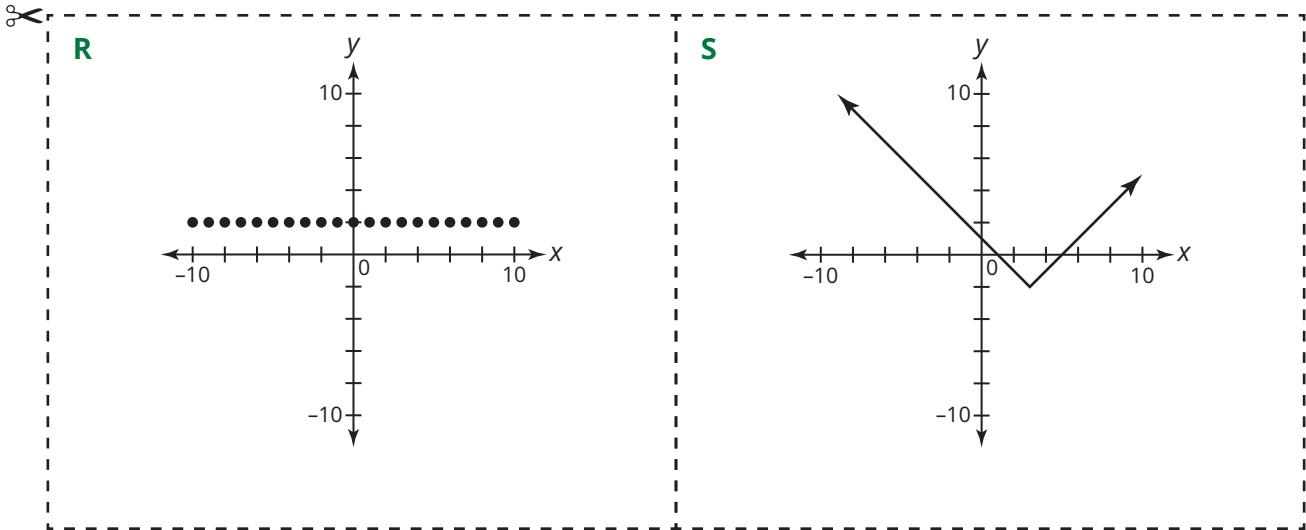
Are any of the graphical behaviors shared among your groups? Or, are they unique to each group?

Graph Cards

**A****B****C****D****E****F**







Assignment

Write

Describe the importance of graphical representations.

Remember

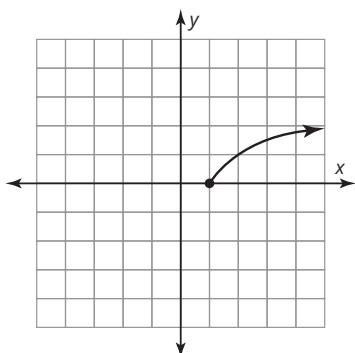
Graphs of relationships between quantities have characteristics that can give you important information about the relationship. For example, a graph can be increasing, decreasing, neither increasing nor decreasing, or both increasing and decreasing. A graph can have straight lines or smooth curves, a maximum or minimum, or no maximum or minimum, and so on.

Practice

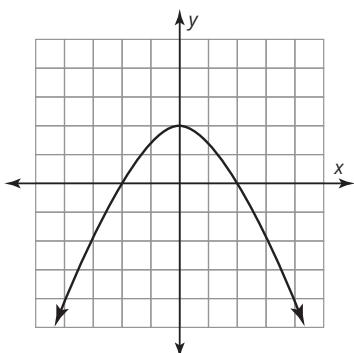
1. Record the letter of each graph with the given characteristic.

- a. has a vertical axis of symmetry
- b. has a horizontal axis of symmetry
- c. passes through exactly 1 quadrant
- d. passes through all 4 quadrants

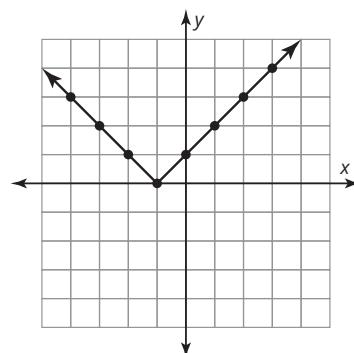
A.



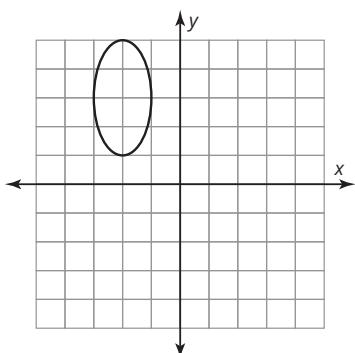
B.



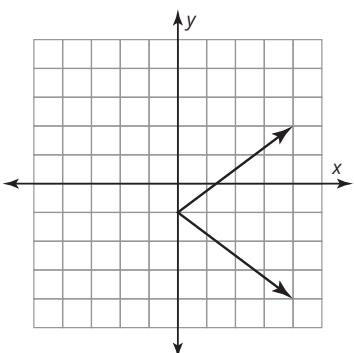
C.



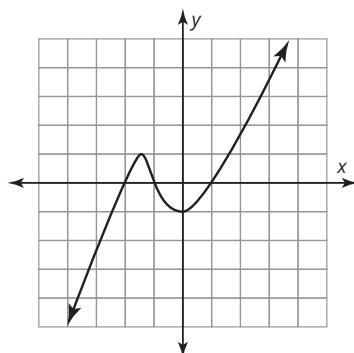
D.



E.



F.



Stretch

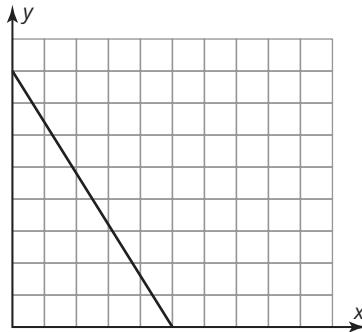
Describe characteristics of each graph, including whether or not it has a vertical or horizontal axis of symmetry and the number of quadrants it passes through.

1. diagonal line through the origin that increases from left to right
2. diagonal line through the origin that decreases from left to right
3. diagonal line that does not pass through the origin
4. horizontal line below the origin
5. vertical line to the right of the origin

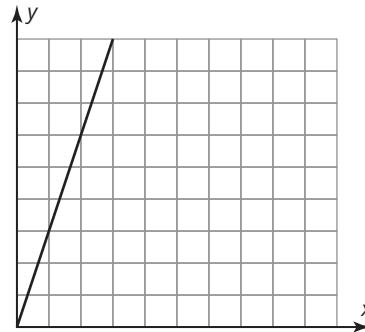
Review

1. Read each scenario and identify the independent and dependent quantities. Be sure to include the appropriate units of measure. Then determine which graph models the scenario.
 - a. Henry is cooking a turkey for his family. His recipe says to cook the turkey for 15 minutes per pound.

Graph A

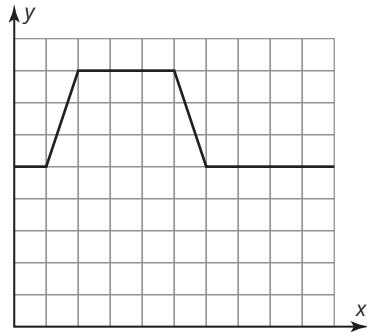


Graph B

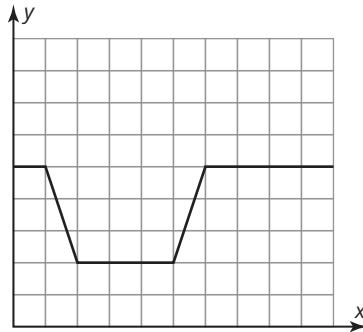


- b. When Jane exercises on an elliptical machine, her initial heart rate is 90 beats per minute. She warms up at this rate for 5 minutes. Over the next 5 minutes, she gradually increases to 150 beats per minute. She maintains that rate for 15 minutes before gradually decreasing back to her original heart rate at the end of her 30-minute workout.

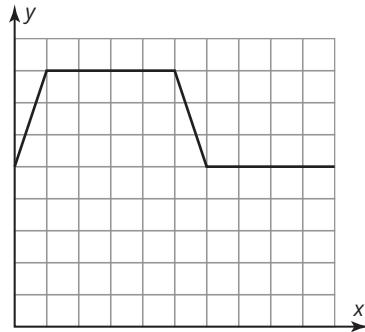
Graph A



Graph B



Graph C



2. Solve the equation $8y + 13 = 29$.

3. Evaluate the expression $6z + 5(-2z - 7)$ for $z = -1$.