

## Stories from Graphs

Summary	
<p>In this lesson, students must match verbal descriptions to distance/time graphs and then create stories to go with distance/time graphs. They also match graphs from calculators and CBRs by moving toward and away from a wall.</p>	
Utah Core Standards	
<p>Algebra II - Standard 2, Objective 2.3 Process Standards 1-5</p>	
Desired Results	
Benchmark/Enduring Understanding	
<p>Coordinate graphs tell stories about numeric patterns and relationships. By using the graph variables and examining the type of line, direction of slant, slope and placement of the line, one can read the stories about the variables and their relationships.</p>	
Essential Questions	Skills
<ul style="list-style-type: none"> <li>• How can a graph tell a story?</li> <li>• What kinds of stories do different coordinate graphs tell?</li> </ul>	<ul style="list-style-type: none"> <li>• Interpreting distance versus time graphs</li> <li>• Interpreting the Y-intercept of the graph to represent the starting point</li> <li>• Interpreting the slope of the graph to represent the rate of change.</li> </ul>
Assessment Evidence	
<ol style="list-style-type: none"> <li>1. Students will complete worksheet accurately.</li> <li>2. Class discussion will demonstrate understanding of graphs, slope, and y-intercept.</li> </ol>	

Instructional Activities
<p><b>Launch:</b> Introduce the CBR and demonstrate how it works, demonstrating with one or two students. Give students time to work Part I on their own.</p> <p><b>Explore:</b> Students work in groups to discuss Part I and to complete Parts II, III, and IV of the worksheet. The extension can be given for homework.</p> <p><b>Summarize:</b> The discussion of the lesson should include the following important understandings:</p> <ol style="list-style-type: none"> <li>1. Graphs are important ways of representing real situations.</li> <li>2. The y- intercept of the graph represents the starting point.</li> </ol>

3. The slope of a distance/time graph represents the speed, emphasizing the concept that the slope is the rate of change.

**Materials Needed**

Worksheets  
Graphing Calculators  
CBRs

# Stories from Graphs

## Part I

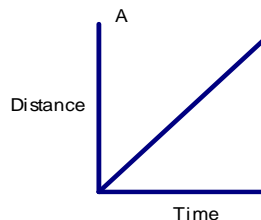
The following graphs represent different trips Bryn has made walking to and from school. All distances are measured as distances from home.  $D = 0$  is at her home, and  $t = 0$  is her starting time.

1) What did she do to create a graph that looks like this?

Explain:

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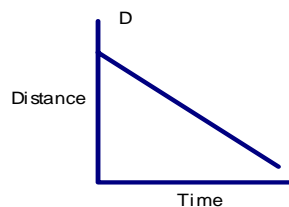


2) What did she do to create a graph that looks like this?

Explain:

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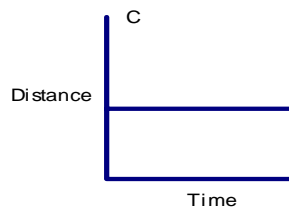


3) What did she do to create a graph that looks like this?

Explain:

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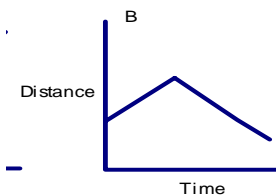


4) What did she do to create a graph that looks like this?

Explain:

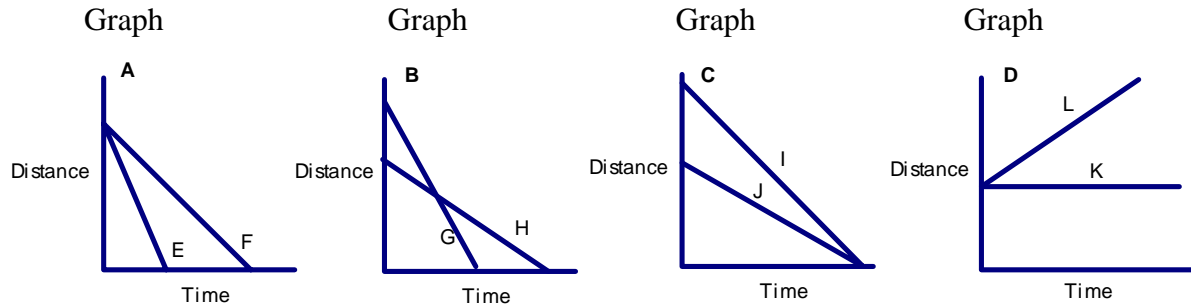
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## Part II

These graphs represent trips taken by two students, a brother and sister. The distance is measured from their home.  $D = 0$  is at their home, and  $t = 0$  is their starting time.



A) For graph A, answer the following: Which student is walking faster—E or F?

Explain: \_\_\_\_\_

B) For graph B, which student starts further away, and what does the intersection mean?

Explain: \_\_\_\_\_

C) For graph C, describe the trips of students I and J?

Explain: \_\_\_\_\_

D) Describe the similarities and differences in the trips of students K and L.

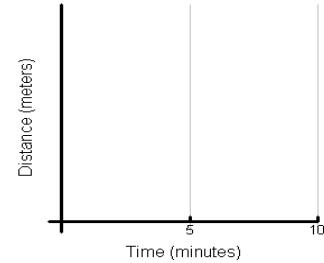
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### Part III

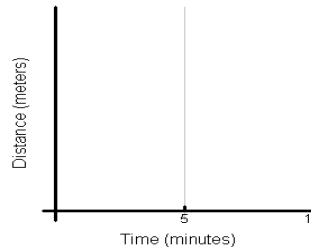
The following graphs represent different trips Bryn has made walking to and from school. All distances are measured as distances from home.  $D = 0$  is at her home, and  $t = 0$  is her starting time.

Sketch the distance–time graph that corresponds to each of the following descriptions.

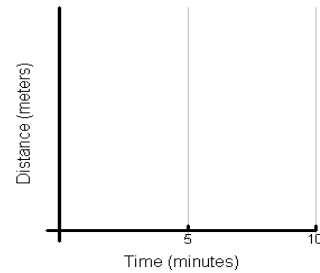
1. The student moves at a steady speed away from her starting point.



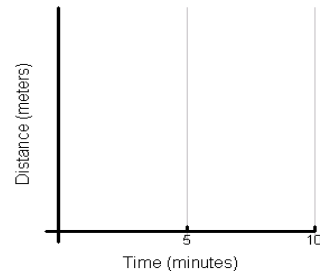
2. The student is standing still.



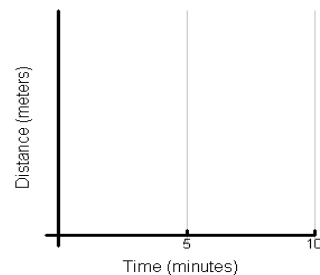
3. The student moves at a constant speed towards home for 5 seconds and then stands still for 5 minutes.



4. The student moves at a constant speed away from home for 5 seconds, then reverses direction and moves at the same speed toward the origin for 5 minutes.



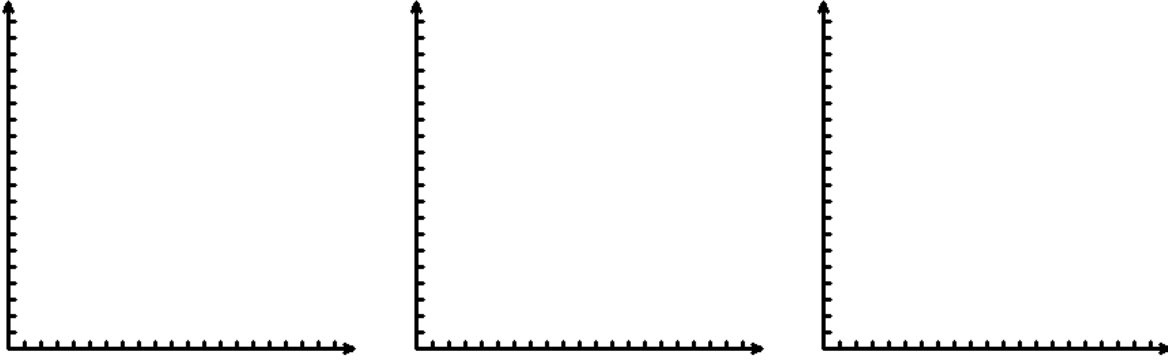
5. The student moves away from the origin, starting slowly and speeding up.



### Part IV

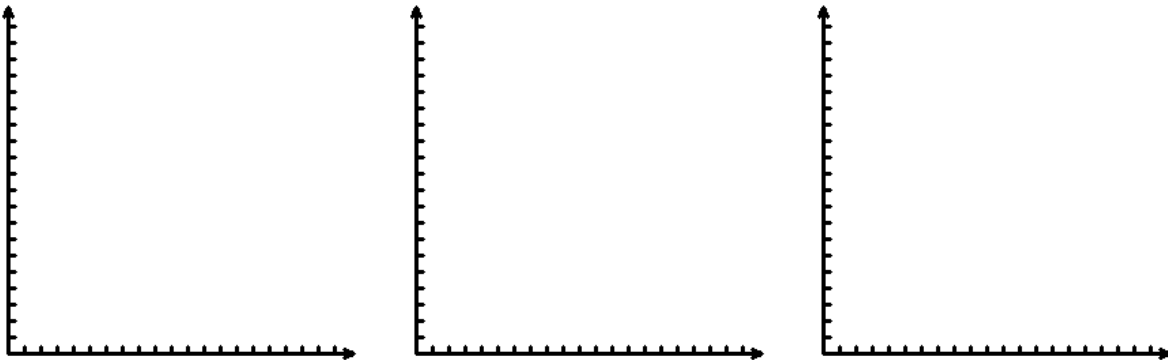
Using the CBR, try to create the graph of each of the following lines. Each person on your team must try to walk each story below. As each person tries, sketch the line they created and write a suggestion for what should be done to make their graph more closely match the story given.

- 1) a line that rises at a steady rate.



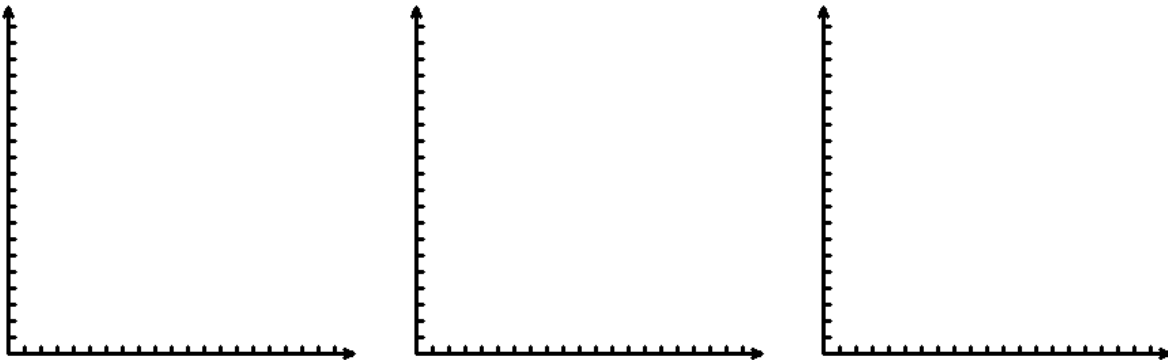
Suggestions:

- 2) A line that falls at a steady rate.



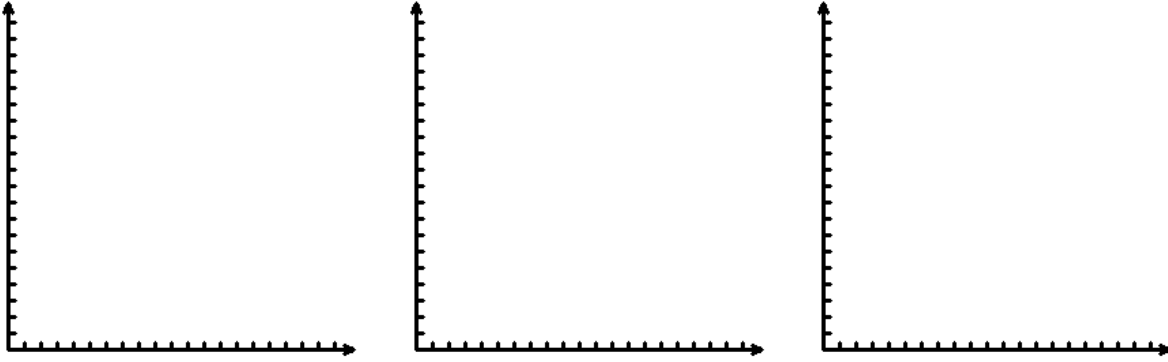
Suggestions:

- 3) A horizontal line



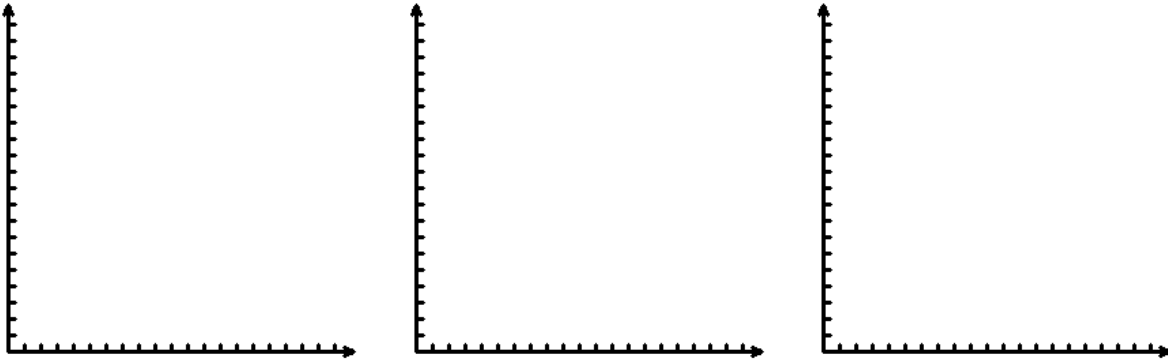
Suggestions:

4) A “V”



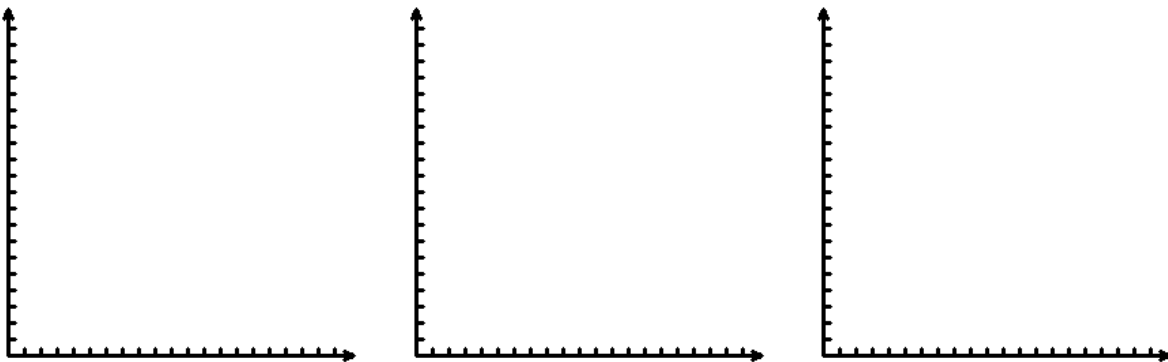
Suggestions:

5) A “U



Suggestions:

6) An “M”



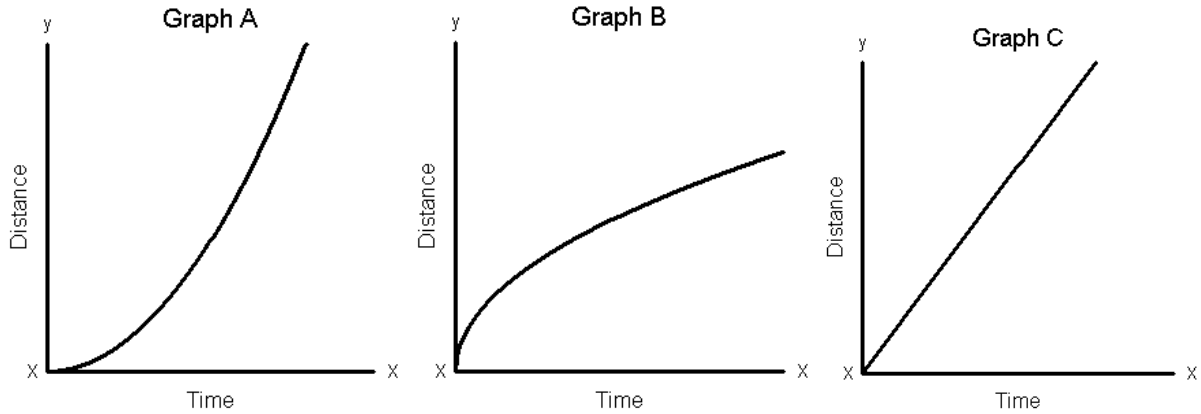
Suggestions:

7) Try creating an O. Are you successful? Why or why not?

Name a letter you could graph using the CBR. Name a letter you cannot graph using the CBR. Explain your choices.

## Extension

It is true that we don't walk at exactly the same speed all the time. The following graphs tell the stories of three different students leaving school. Write a story for the graphs which explains how the three students moved. Be sure that your story includes an explanation of why the first two graphs are curved.



A)

B)

C)

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