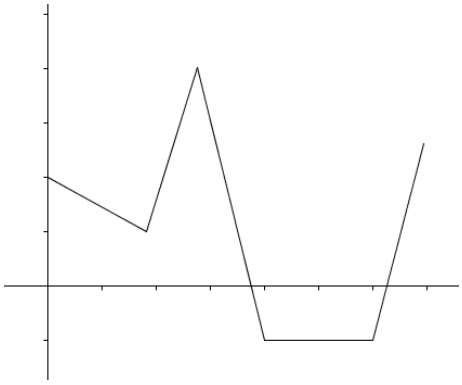
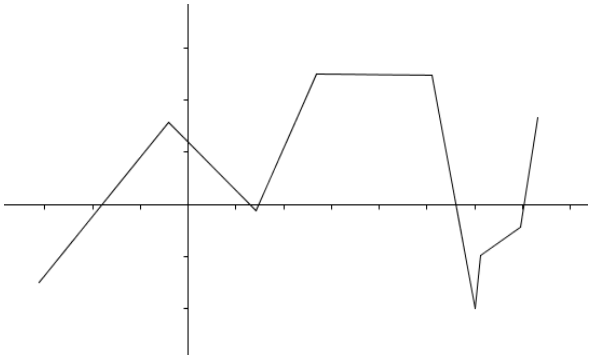
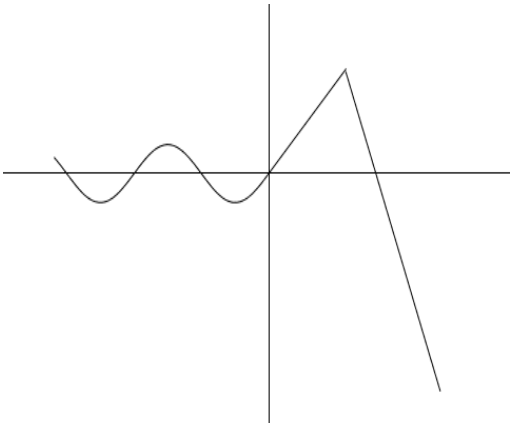
Functions 6 – Shape of a Graph Name _____
6.1 – Warmup Per _____ Date _____

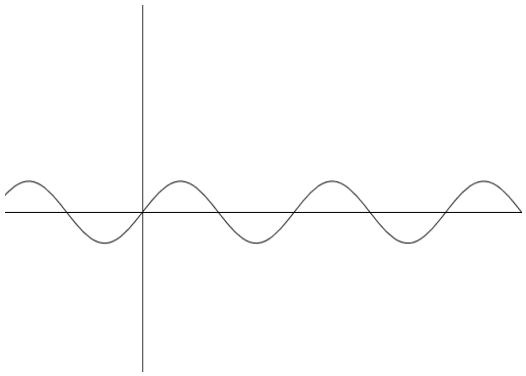
For each of the following, highlight/shade the regions of the graphs that correspond to different graph shapes (constant, increasing, or decreasing).

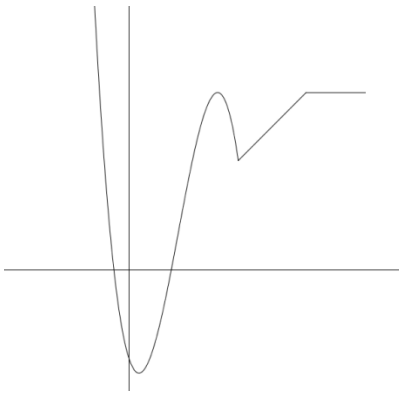
Shading: Pencil = Constant Black = Increasing Blue = Decreasing

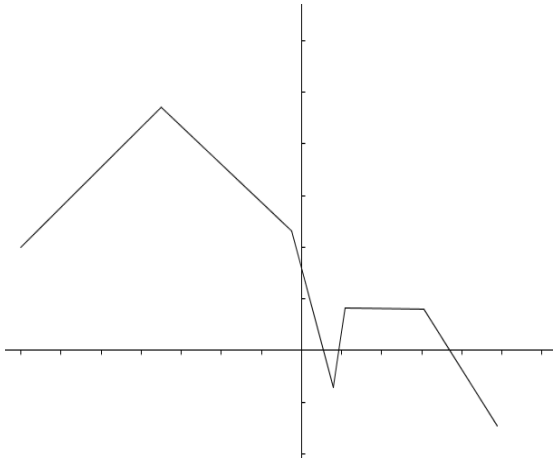










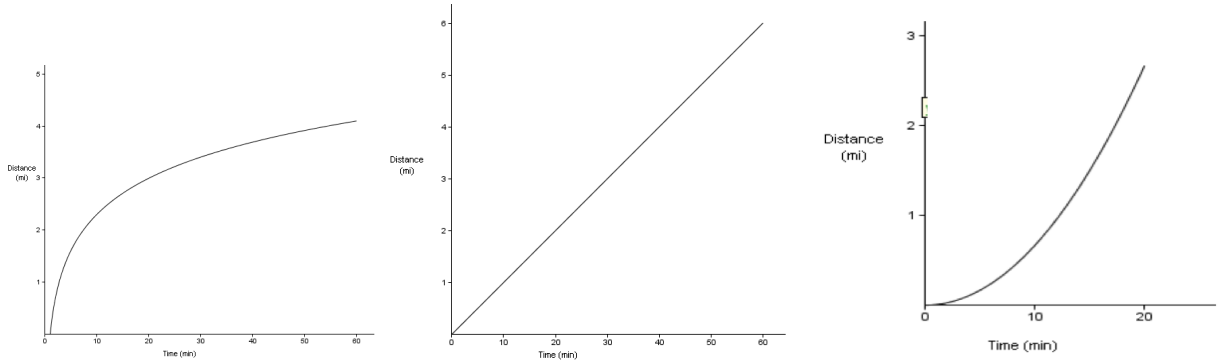


Each of the three below graphs is a plot of a runner's distance traveled versus time. Match each graph to a particular runner based on the description of each runner's behavior.

A. Ray runs cross-country for his high school team. He decides to go for a jog around the park on Tuesday afternoon. Luckily for him, there were not many people at the park and he could run at a comfortable pace for an hour.

B. Jessie usually walks to school in the mornings. Today she did not check the time when she left her house. As she started walking, she realized that she was late and sped up until she sprinted to get to her class on time.

C. Bill decided to go for a run as his exercise for the day. He started out sprinting around his neighborhood, but fatigue kicked in and he had to slow down until his run became a walk, and eventually slowed to a stroll.



We can also develop vocabulary to help us describe the above shapes of graphs. All three are *increasing* functions (they go up in height as you move to the right). However, the way they go up is different. Thus, we describe the rate at which these graphs are increasing:

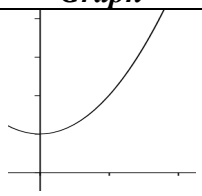
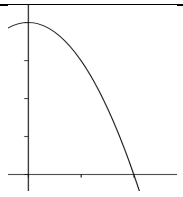
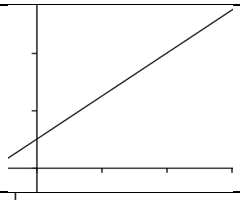
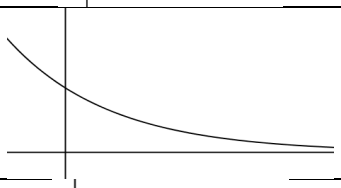
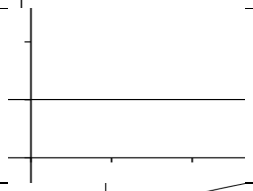
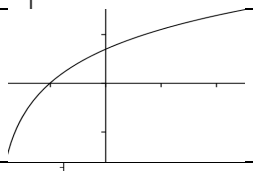
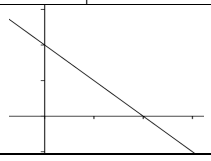
The left graph is *increasing at a decreasing rate.*

The middle graph is *increasing at a constant rate*.

The right graph is *increasing at an increasing rate*.

Functions 6 – Shape of a Graph Name _____
6.3 – Shapes of Graphs Per _____ Date _____

Fill in the following table. Choose from the 7 Verbal Descriptions at the bottom of the page and for your example make up a short story that would match the shape of the graph.

Graph	***Verbal Description***	***Example***
		
		
		
		
		
		
		

Verbal Descriptions:

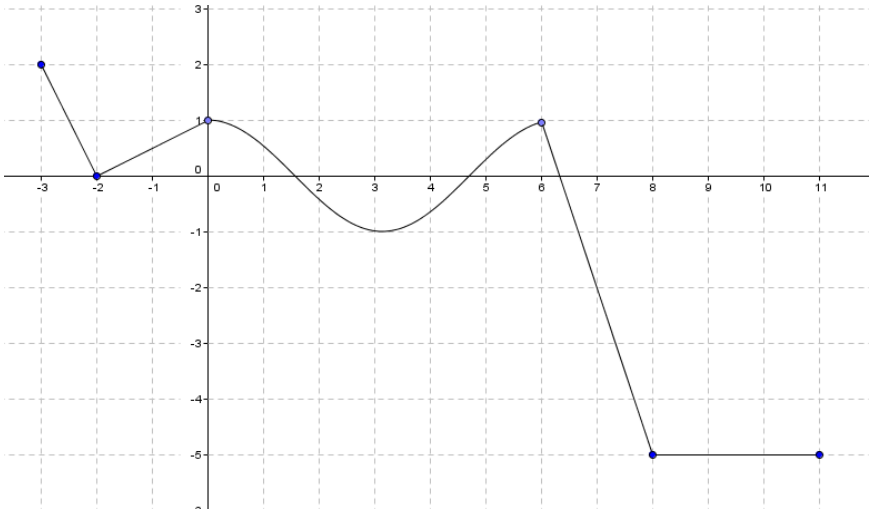
Decreasing at a constant rate	Increasing at a decreasing rate	Decreasing at a decreasing rate
Increasing at a constant rate	Increasing at an increasing rate	Decreasing at an increasing rate
Constant		

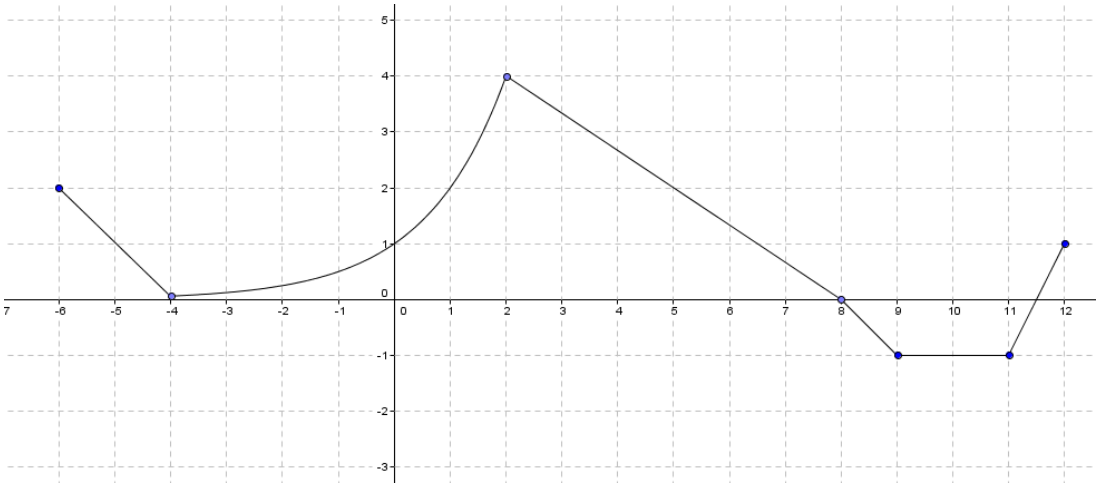
Name _____
Per _____ Date _____

Vocabulary toolbox:

Constant	Increasing
Decreasing	Linear
Increasing at an increasing rate	
Decreasing at a decreasing rate	
Increasing at a decreasing rate	
Decreasing at an increasing rate	

Describe the shapes of the different parts of the graphs below using the vocabulary toolbox. Mention specific points of interest in your descriptions. More than one behavior may apply at a time.

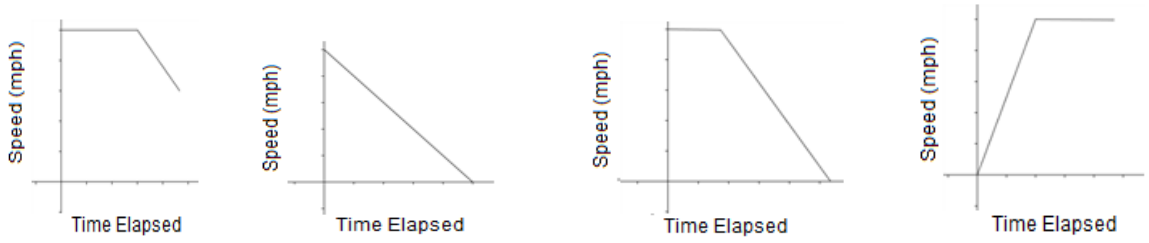




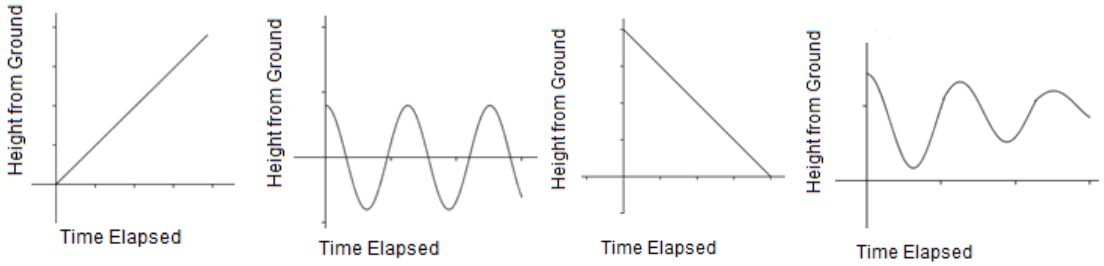
Name _____
Per _____ Date _____

Circle the graph that best represents the below scenarios.

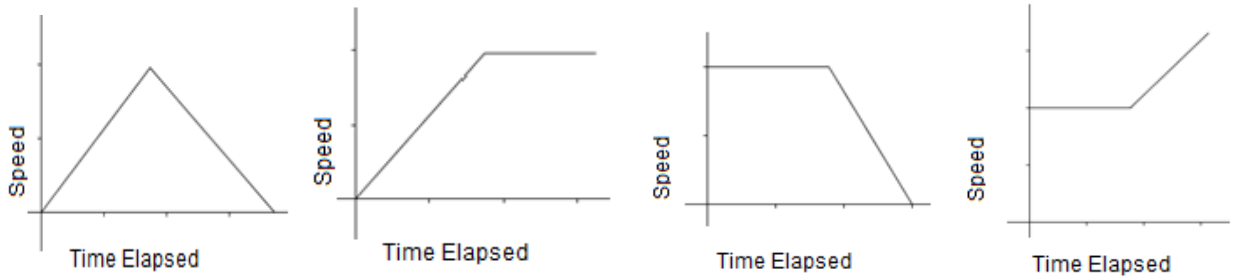
1. A school bus drives 30 miles per hour for a while and then pulls into the school and lets off students. Which graph best represents the bus' speed as a function of time?



2. A bungee jumper jumps off a 100-foot high bridge. Which graph best represents her height from the ground as a function of time?

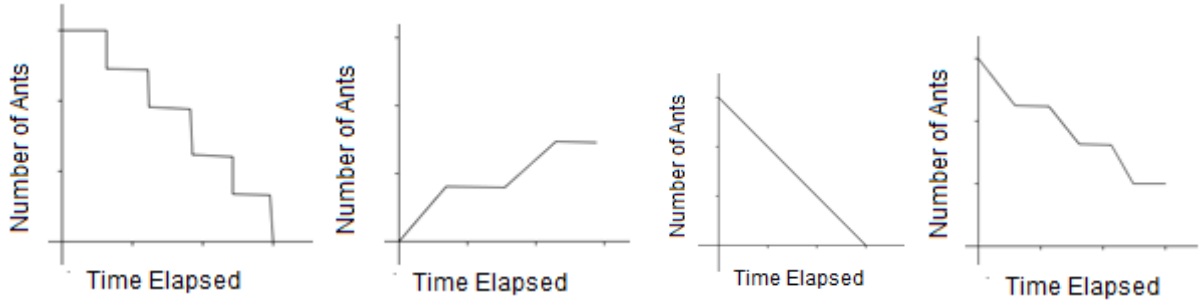


3. A bicyclist climbs up a hill at a steady pace of 10 miles per hour and then speeds up as she glides down the other side. Which graph best represents her speed as a function of time?

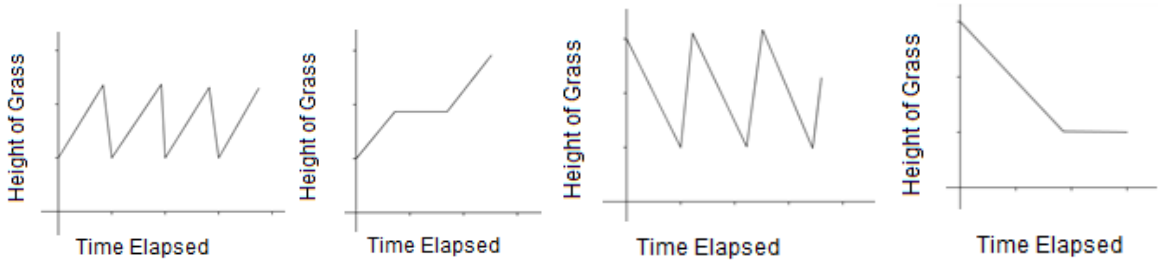


Name _____
Per _____ Date _____

4. An anteater at the zoo is given ants for lunch. He slowly eats 4 ants and takes a break, repeating this pattern throughout lunch. Which graph best represents the number of ants remaining as a function of time?



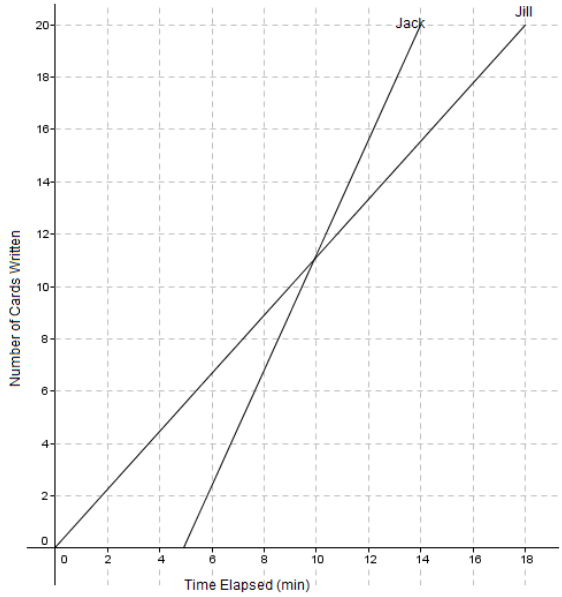
5. A lawn service mows the grass every three weeks. Which of the below graphs best represents the height of the grass as a function of time?



Name _____
Per _____ Date _____

Below are 3 scenarios and corresponding graphs. For each, you are to do the following answer the given question and then write a more detailed story consistent with the various parts of the graph. Be sure to include appropriate units!

1. Twins Jack and Jill need to each write 20 thank-you notes for their birthday presents.

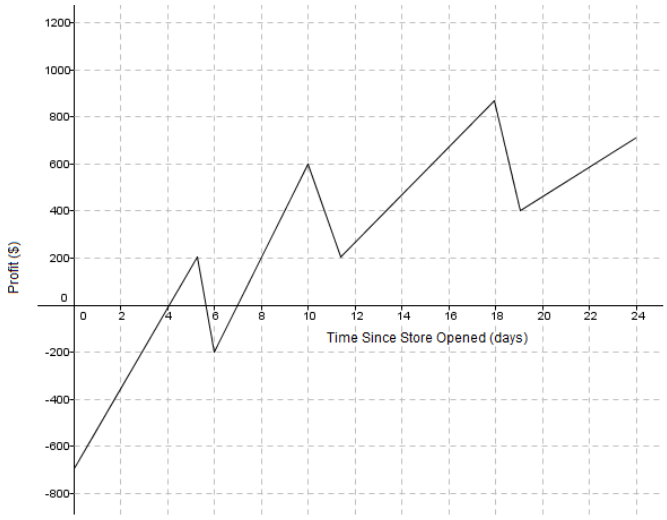


Based on the graph, which twin finished their thank-you notes first and how fast did each twin write their notes?

Write a story about what each of them did to get their job done, according to the graphs.

Name _____
Per _____ Date _____

2. Marley started a pet boutique in the mall. He used his own money to start-up the business, but eventually started making a profit.

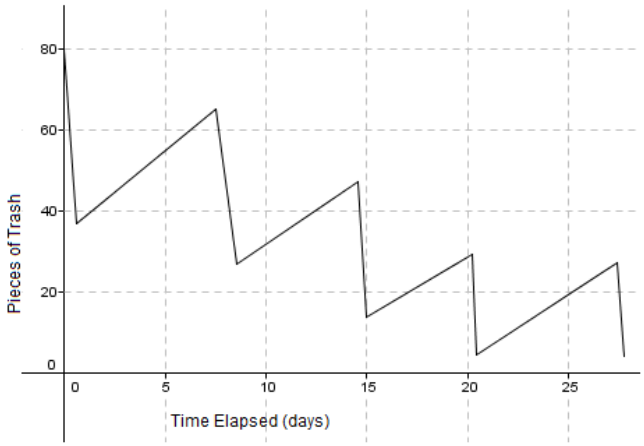


During which day is Marley's profit the highest?

Describe a possible scenario of what Marley did in order that his profits resulted in the graph. Be sure to include what he does during days 0 – 4.

Name _____
Per _____ Date _____

3. The Earth Activist Club noticed that the beach was increasingly covered with litter. They organized a one-month cleanup campaign at the beach that resulted in the graph provided. Describe their plan and the results, and explain if the Earth Activist Club was successful and how you determined this.



How many pieces of trash did the beach have at the start?

Describe the Earth Activist Club's plan and the results. Be sure to explain if the Club was successful at cleaning up the beach.