Egg Launch Contest

NAME: Student Sample
DATE: _____

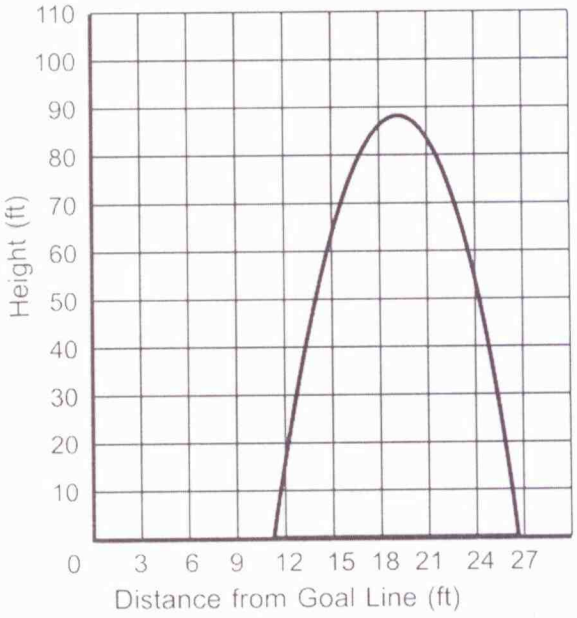
Mr. Rhodes' class is holding an egg launching contest on the football field. Teams of students have built catapults that will hurl an egg down the field. Ms. Monroe's class will judge the contest. They have various tools and ideas for measuring each launch and how to determine which team wins.

Team A used their catapult and hurled an egg down the football field. Students used a motion detector to collect data while the egg was in the air. They came up with the table of data below.

Distance from the Goal Line (in feet)	Height (in feet)
7	19
12	90
14	101
19	90
21	55
24	0

Team B's egg flew through the air and landed down the field. The group of students tracking the path of the egg determined that the equation $y = -0.8x^2 + 19x - 40$ represents the path the egg took through the air, where x is the distance from the goal line and y is the height of the egg from the ground. (Both measures are in feet.)

When **Team C** launched an egg with their catapult, some of the judges found that the graph to the right shows the path of the egg.



Which team do you think won the contest? Why?

I think team team A won the contest because their egg went the heighest up in the air.

Team A

1. Using the data from Team A, determine an equation that describes the path of the egg. Describe how you found your equation. $y = -1.31x^2 + 39.64x - 195.07$
2. On the graph below, graph the path of Team A's egg.
3. What is the maximum height that the egg reached? How far was the egg hurled?

104.78 was the max height.
The egg was hurled 17.88 feet.

Team B

4. Using the equation from Team B, generate a table of values that shows different locations of the egg as it flew through the air.

x	6	7	8	9	10	11	12	13	14	15	16	17
y	45.2	53.8	60.8	66.2	70	72.2	72.8	71.8	69.2	65	59.2	51.8

5. On the graph below, graph the path of Team B's egg.
6. What is the maximum height that the egg reached? How far was the egg hurled?

The max height was 72.81.
The egg was hurled 19.081 feet

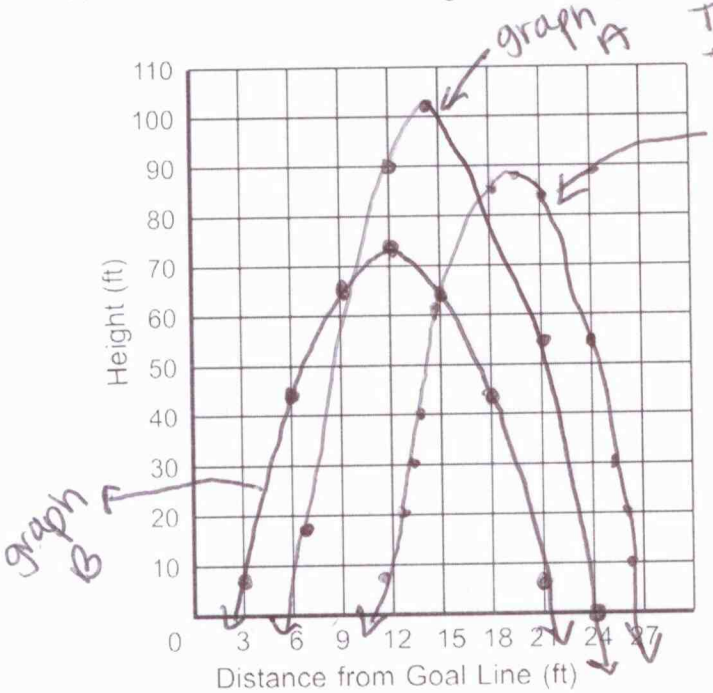
Team C

7. Using the data from Team C, generate a table of values that shows different locations of the egg as it flew through the air.

x	11	12	13	15	18	19	21	23	24	25	26	
y	10	19.8	20	62	86	88	83	62	52	40	20	

8. On the graph below, re-graph the path of Team C's egg. $y = -1.3x^2 + 49.67x - 389$
9. What is the maximum height that the egg reached? How far was the egg hurled?

The max height was 85.24 using this equation
The egg was hurled 16.2 feet



10. If it is a height contest, which team wins? How do you know?

Team A because it has the highest maximum

11. If it is a distance contest, which team wins? How do you know?

Team B because it has the greatest distance between its x-intercepts

12. Find a method of determining a winner so that the team that did not win in Question 10 or Question 11 would win using your method.

The largest rate of change was team C.