Powell Tourism Authority
234 Kitso Drive
Page, AZ 85790

Independent Mathematics Contractors
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Anytown, Anystate 00000

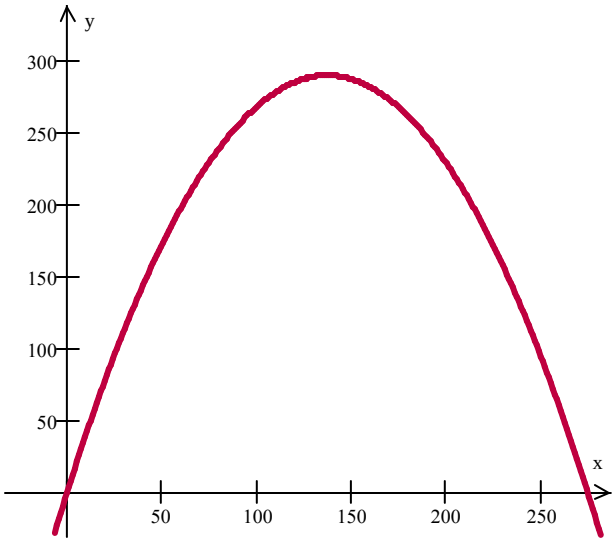
Dear IMC:

The Rainbow Bridge near Lake Powell appears to have the shape of a parabola. This shape was formed by wind and water eroding the surrounding stone. Since the shape of the arch is a mathematical curve, I am interested in knowing what the function describing this structure is. To do this you'll need to use the form

$$f(x) = a(x-h)^2 + k$$

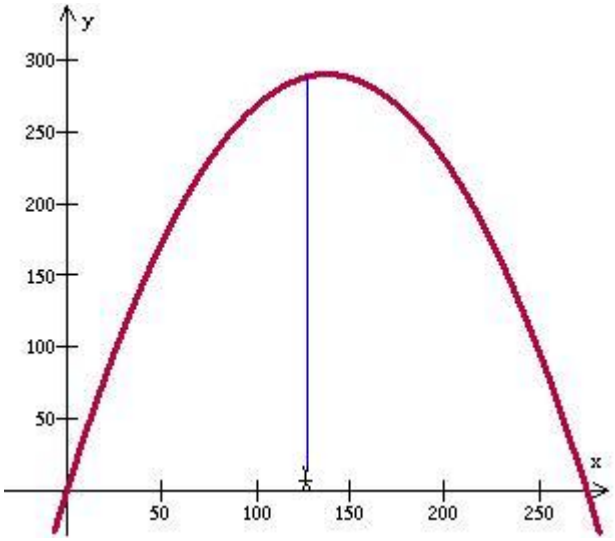
and find appropriate values of a, h, and k. To insure that you are headed in the right direction, let me give you some information about the arch and the format for this function.

1. The arch is 290 feet high.
2. The arch is 275 feet wide at ground level.
3. The function you find should assume that the arch is place in a coordinate system in which the x axis is at ground level and the y axis goes through the left hand side at ground level (see below).



The reason I need to know this function is simple, money and safety. We plan to lobby the National Park Service and the Navajo Nation to allow qualified people to bungee jump from

different locations on the arch. Of course, we need to submit a plan to insure that rope is of such a length so that no one is killed. This means that we want people to jump from the arch and then be able to dip the top of their head in the water below, before the rope pulls them back up. If we use a rope that is 290 – L feet long (where L is the total number of letters in your first, middle and last name), where should position the rope horizontally to insure the experience described above?



Please document your solution and the process you used to get your solution in a technical memo. I also need to include the details in my proposal to the National Park Service and the Navajo Nation so pay careful attention to documenting this process. It has been 10 years since I took college algebra, so include enough details for a reader of my abilities.

Sincerely yours,
Hugh G. Archie