Algebra 1
Quadratic Equations

Name _____
Group Members:

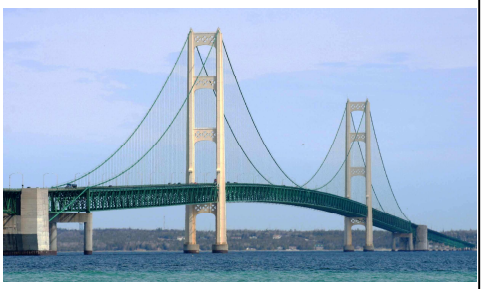
BRIDGES

Fun Facts

The longest suspension bridge is Akashi-Kaikyō Bridge, located in Japan.

The Verrazano-Narrows is the largest suspension bridge in the U.S., connecting Brooklyn and Staten Island.

Pittsburgh has more bridges than any other city in the country.

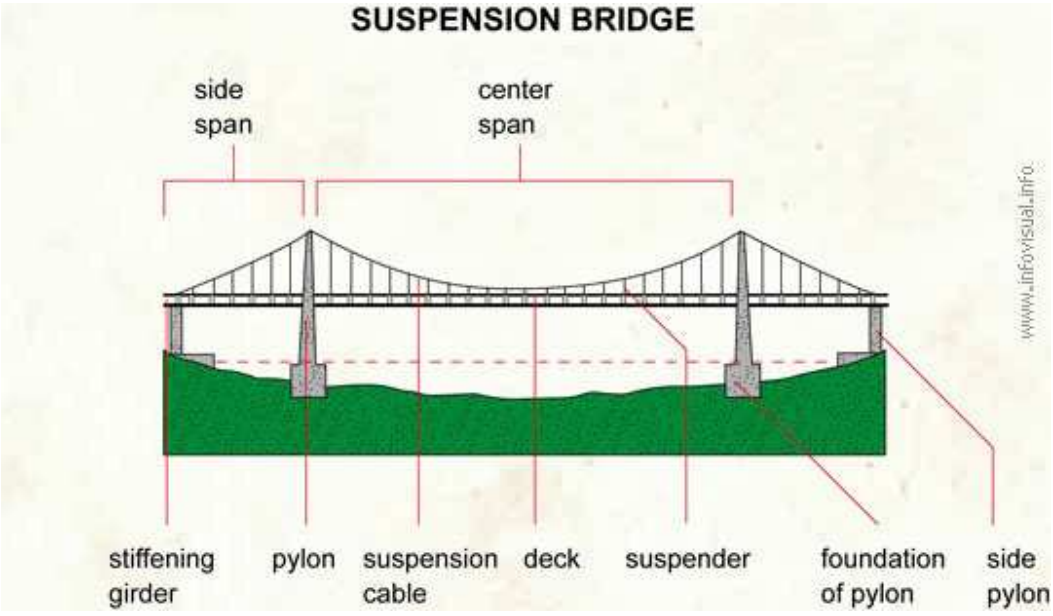


(Mackinaw Island Bridge)

Introduction: When the main (curved) cables are attached to the deck/road by the vertical cables they will end in the shape of a parabola. Assume that we need to build a bridge that spans 2,400 feet over the Chicago River for the 2016 Olympics. The two towers, 165 feet tall each, are placed at 400 feet from either side. The lowest point of the main cable is reached in the center of the bridge at 10 feet. Vertical suspension cables are placed at 25-foot intervals.

Problem: How many feet of cable do we need to connect the deck to the main cables between the two towers?

Suggested Material: graph paper, graphing calculator, scratch paper



What do we need to know to answer our question? How can we find it?

Work

Solution

GROUP PROJECT

Choose a suspension bridge located anywhere in the world.

You are responsible for replacing the suspenders (vertical cables) between the pylons. ***Let's assume*** that the lowest point of the main suspension cable is at the center of the bridge 10 feet above the deck and suspenders are placed at 25 foot intervals.

QUESTION TO ANSWER: How many feet of cable are needed to replace the suspenders between the two pylons? Show all your work.

Presentation of your solution

Your group will present a power point presentation which will include 5 slides.

#1 A picture of the bridge with a written description. Your description should include

a. its location,
b. length of the main/center span
c. height of the pylons/towers
d. distance pylons are from the ends of the bridge
e. interesting details
f. source of reference

#2 A paragraph discussing your problem solving strategy. Include the steps and information you will use to solve the problem.

#3 An algebraic model (equation) of your bridge. Include the picture of your bridge put onto a coordinate grid and your calculations. SHOW YOUR WORK!

#4 A table of data or computations showing how you determined the amount of cable needed. SHOW YOUR WORK!

#5 A sentence summarizing the answer to the question.

Bridge Project Rubric **Names:**

RUBRIC

Slide #	3 points	4 points	5 points
1	Picture and location	Include dimensions	Include unique features, and reference
2	Contains 1- 2 steps that make mathematical sense	Contains 3 steps that make mathematical sense	Is multi-step, easy to follow and makes mathematical sense from beginning to end
3	Picture or drawing is put onto the x-y coordinate plane.	In addition to graph, key features are identified and a mathematical model is chosen	In addition to graph, the correct mathematical model is chosen and the derived equation is correct
4	Less than half of the necessary computations are present and correct.	The majority of the necessary computations are present, correct and organized	All of the necessary computations are present, correct and organized
5	An incorrect answer is given in a complete sentence.	The answer is correct but not in a complete sentence	The answer is correct and written in a complete sentence
Presentation	Each person spoke	Each person spoke in an organized and clear manner	The information presented was concise and correct. The presentation flowed nicely in a smooth manner.

Total: _____ / 30 points