# Golden Gate Bridge

The construction of the Golden Gate Bridge was completed in 1937. It was the longest suspension bridge until 1981 and the tallest of any type of bridge until 1993. Built to withstand strong currents, blinding fog, high winds up to 90mph, and earthquakes measuring up to 8.0 on the Richter Scale, the bridge was named one of the seven civil engineering wonders of the United Sates by the American Society of Civil Engineers in 1994.

<https://www.history.com/topics/landmarks/golden-gate-bridge>

Determine how far you would walk from one end of the suspension span to the other. The picture below will help by superimposing a parabola represented by the equation over a picture of the Golden Gate Bridge where is the distance of the main cable in feet from the roadway and is the distance of the cable in feet from the South Tower (San Francisco side). Points are labelled for your reference.

*y*

https://upload.wikimedia.org/wikipedia/commons/2/2a/Golden\_Gate\_Bridge\_Dec\_15\_2015\_by\_D\_Ramey\_Logan.jpg

(,c)

(b,a)

(0,a)

*x*

**The Main Span:** Use the coordinate grid and what you know of finding points on a graph to find the distance between the two towers. *(Hint: the two towers are the same height)*

**The Side Spans:** Note that the two ends of the bridge each form a right triangle. If the length of the cable from the top of the tower to the base at the end of the bridge is 1231 ft how far would you have to walk to get to one end of the bridge from the other.



d

d

1231 ft

1231 ft

Finally, calculate the height of the main spanning cable at it’s lowest point. Could you touch the main cable at any point while you walk across?

# More interesting facts

Suspension bridges are less expensive to build than rigid bridges; they can span longer distances using less material. However, they must have movement designed into their structure. The bridge deck of the Golden Gate Bridge was designed to move 15 feet vertically and 27 feet from side to side to accommodate wind, change in temperature or load. There was a lot of engineering and math involved in building the bridge and they had to get it right!



https://www.sfchronicle.com/local/article/Golden-Gate-bridge-walk-1987-anniversary-disaster-13896571.php#photo-8690881

## Suspension bridge collapse

<https://www.youtube.com/watch?v=XggxeuFDaDU>

<https://www.youtube.com/watch?v=j-zczJXSxnw>L

Lest you think bridges only collapsed when my father was a child see:

<https://www.youtube.com/watch?v=KRtefycRGdE>

A brief factsheet for the Golden Gate Bridge: <https://www.fhwa.dot.gov/candc/factsheets/goldengatebridge.pdf>