

Section 3.4. Build Quadratic Models from Verbal Descriptions and from Data

Note. In this section we build quadratic models from verbal descriptions (that is, we consider word problems involving quadratic models). The text book also covers quadratics models from data, but we skip this topic. We work several examples.

Example 3.4.2. A farmer has 2000 yards of fence to enclose a rectangular field. What are the dimensions of the rectangle that encloses the most area?

Example 3.4.4. The Golden Gate Bridge, a suspension bridge, spans the entrance to San Francisco Bay. Its 746-foot-tall towers are 4200 feet apart. The bridge is suspended from two huge cables more than 3 feet in diameter; the 90-foot-wide roadway is 220 feet above the water. The cables are parabolic in shape and touch the road surface at the center of the bridge. (A cable suspended from two towers is in the shape of a *catenary*, but when a horizontal roadway is suspended from the cable, the cable takes the shape of a parabola. For more details, see my online notes for the engineering class *Applied Mechanics 1 (Statics)* on [Section 10.4. Loads Distributed Uniformly Along Straight Lines.](#)) Find the height of the cable above the road at a distance of 1000 feet from the center.

Examples. Page 154 number 6 and Page 155 number 16.