

Lesson 9

Read Chapter 7

Quadratic modelling

Tom kicks a ball. When the ball is 6 feet to the east of Tom the ball height is $\frac{75}{8}$ feet, the ball reaches a maximum height of 10 feet 8 feet to the East of Tom. How far to the East of Tom does the ball fall back to the ground ? The ball's trajectory is a parabola.

A drainage canal has a cross section in the shape of a parabola. Suppose the canal is 10 feet deep and 20 feet wide at its top. If the water depth in the ditch is 5 feet, how wide is the surface of the water in the ditch?

Enrollment in an online course is modeled by a quadratic function. At the beginning of the quarter ($t = 0$) 300 students are enrolled in the class. Five days later ($t = 5$) 450 students are enrolled. Twenty five days later ($t = 25$) only 50 students are enrolled. The class is terminated when it has no more students. When is it terminated? What was the maximum number of students enrolled?

Enrollment in an online course is modeled by a quadratic function. At the beginning of the quarter ($t = 0$) 62 students are enrolled in the class. One week later ($t = 7$) the class reaches its maximum enrollment of 160 students. How many students are there in the class at $t = 14$? When is the class terminated?