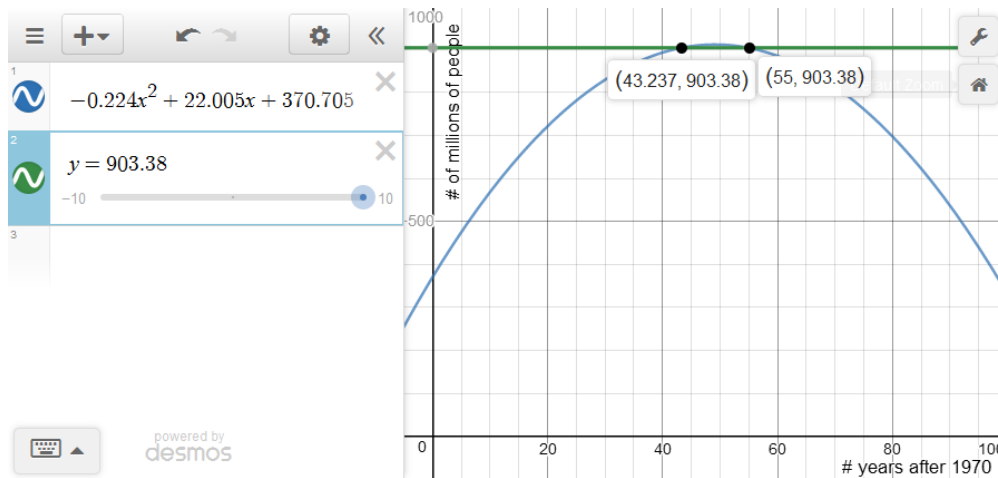


College Algebra, Section 4.4, #60  
Additional Equations and Inequalities

**China's Labor Pool** Data from 1975 and projections to 2050 of the number of millions of people age 15 to 59 in China can be modeled by  $y = -0.224x^2 + 22.005x + 370.705$ , where  $x$  is the number of years after 1970 and  $y$  represents the number of millions of people in this labor pool. During what years from 1970 to 2050 is the number of people age 15 to 59 at least 903.38 million. (Source: United Nations) <sup>1</sup>

We want to know what values of  $x$  will result in the labor pool being at least 903.38 million. That is: For what values of  $x$  is  $y \geq 903.38$ ?

To answer this question graphically, we graph the original function  $y$  and find the values of  $x$  when the graph of  $y = -0.224x^2 + 22.005x + 370.705$  is ABOVE OR EQUAL TO the line  $y = 903.38$ .



Here we see that  $y = -0.224x^2 + 22.005x + 370.705$  is above or equal to the line  $y = 903.38$  in the interval (43.237, 55).

These  $x$ -values represent the number of years after 1970 and we can say that the number of people age 15 to 59 in China's labor pool was at least 903.38 million between the years 2014 and 2025.

<sup>1</sup>Harshbarger/Yocco, *College Algebra In Context*, 5e, p. 300, #60.