

# Unit 7 Lesson 2: When and Why Do We Write Quadratic Equations?

## 1 How Many Tickets? (Warm up)

### Student Task Statement

The expression  $12t + 2.50$  represents the cost to purchase tickets for a play, where  $t$  is the number of tickets. Be prepared to explain your response to each question.

1. A family paid \$62.50 for tickets. How many tickets were bought?
2. A teacher paid \$278.50 for tickets for her students. How many tickets were bought?

## 2 The Flying Potato Again

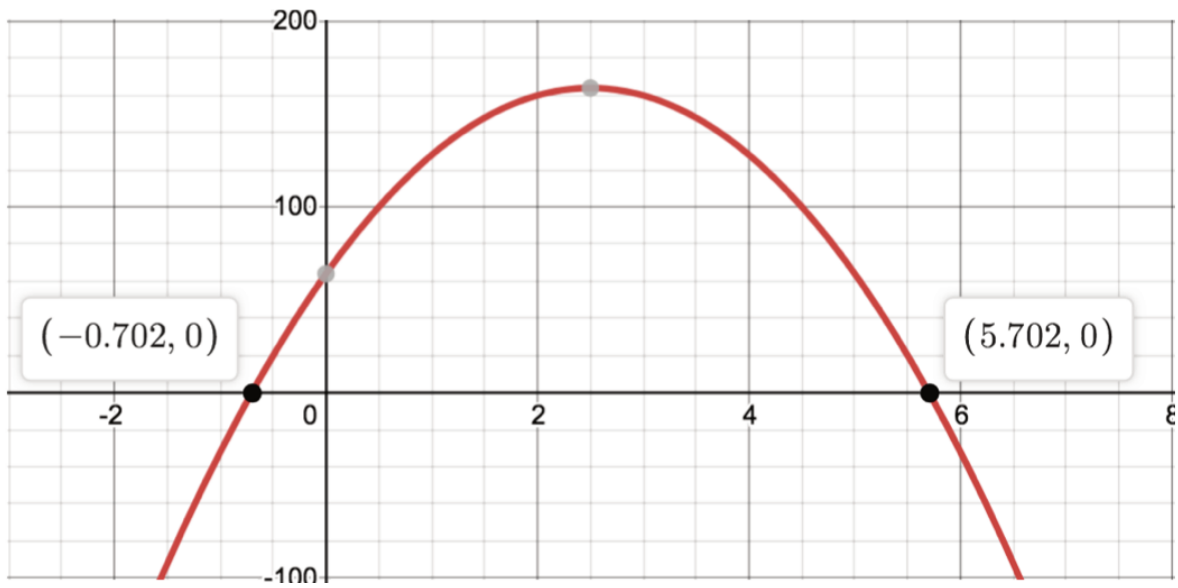
### Student Task Statement

The other day, you saw an equation that defines the height of a potato as a function of time after it was launched from a mechanical device. Here is a different function modeling the height of a potato, in feet,  $t$  seconds after being fired from a different device:

$$f(t) = -16t^2 + 80t + 64$$

1. What equation would we solve to find the time at which the potato hits the ground?
2. Use any method *except graphing* to find a solution to this equation.

### Activity Synthesis



### 3 Revenue from Ticket Sales

#### Student Task Statement

The expressions  $p(200 - 5p)$  and  $-5p^2 + 200p$  define the same function. The function models the revenue a school would earn from selling raffle tickets at  $p$  dollars each.

1. At what price or prices would the school collect \$0 revenue from raffle sales? Explain or show your reasoning.
2. The school staff noticed that there are two ticket prices that would both result in a revenue of \$500. How would you find out what those two prices are?