Parabola

Background:

Katniss is at the training facility to practice skills needed for the games. She finds herself at the spears and decides to try it:

"I throw my spear, which I'm not too bad at actually, if I don't have to throw far…." (P.98)

Katniss is trying to get more skills to help her survival in the games. She practicing throwing a spear to see if she could hit someone in the games with it. When Katniss throws the spear, the path the spear makes from where she is standing to where it lands makes a parabola. Finding the height for the parabola will help Katniss determine if the spear could hit someone far away and if she should use the spear in the games.

1.) The spear is thrown into the air with an initial velocity of 48 ft/s. Its height *h* is in feet after *t* seconds is given by the function $h = -16t^2 + 48t + 5$.

a.) In how many seconds will the spear reach its maximum height? (Use formula $\frac{-b}{2a}$ to help find the time in second).

b.) What is the spear's maximum height? (Plug for result for $\frac{-b}{2a}$ into *t* and solve to find the height).

c.) Should Katniss risk using the spear in the games?

2.) The spear is thrown into the air with an initial velocity of 36 ft/s. Its height *h* is in feet after *t* seconds is given by the function $h = -16t^2 + 36t + 5$.

a. In how many seconds will the spear reach its maximum height?

b. What is the spear's maximum height?

Parabola Answer Key

1.) A.)1.5 seconds

b.) 41 feet

c.) Yes

2.) a.) 1.125 seconds

b.) 25.25 feet