5. [9 points] A diver jumps up off of a diving board into a swimming pool below. Until the moment the diver enters the water, his height above the water (measured in feet) t seconds after his feet leave the diving board is $h(t) = -16t^2 + 8t + 10$.
Throughout this problem, remember to show your work and reasoning.
Give your answers in exact form or accurate to at least three decimal places.

a. [3 points] Use the method of completing the square to rewrite the formula for $h(t)$ in vertex form. (*Carefully show your work step-by-step.*)

Answer: $h(t) =$ _____

b. [2 points] After how many seconds does the diver reach his maximum height above the pool? What is that maximum height?

After _____ seconds, the diver reaches his maximum height of _____ feet.

c. [2 points] After how many seconds does the diver enter the water?

The diver enters the water _____ seconds after his feet leave the diving board.

d. [2 points] In the context of this problem, what are the domain and range of $h(t)$?
(*Use either inequalities or interval notation to give your answers.*)

Domain: _____ **Range:** _____