

7. [11 points] In honor of a favorite video game, a group of students decides to build a huge slingshot on the Diag from which they will launch a variety of large toy stuffed animals.

The first “passenger” is a large stuffed panda. The height of the panda above the ground (measured in feet) t seconds after it is launched from the slingshot is $P(t) = -16t^2 + 48t + 8$.

- a. [3 points] How long is the flying stuffed panda in the air before it lands back on the ground? (*Show your work and give your answer in exact form or rounded to three decimal places.*)

Answer: _____

- b. [4 points] Use the method of completing the square to rewrite the formula for $P(t)$ in vertex form. (*Carefully show your work step-by-step.*)

Answer: $P(t) =$ _____

- c. [2 points] After how many seconds does the flying stuffed panda reach its maximum height above the ground? What is that maximum height?

After _____ seconds, the panda reaches its maximum height of _____ feet.

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

Domain: _____

Range: _____