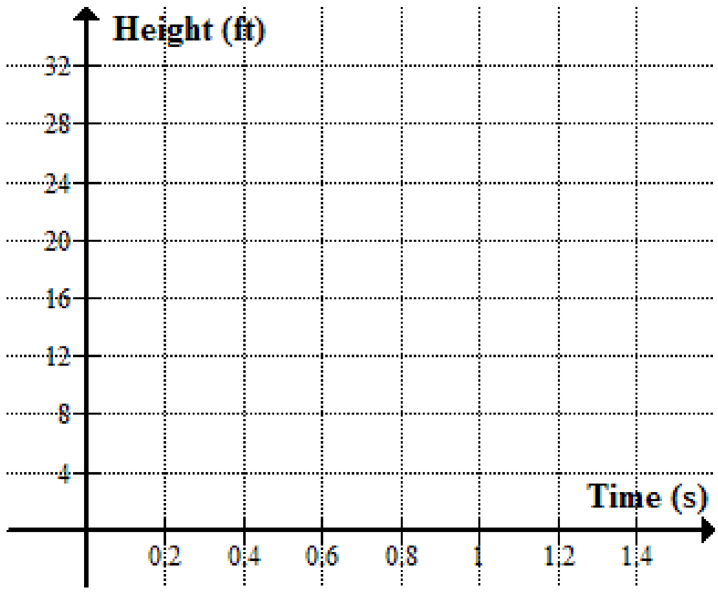
Chapter 8

Model a Situation with a Linear-Quadratic System of Equations

A pelican flying in the air drops a crab from a height of 30 feet above the water. The distance the crab is from the water as it falls can be represented by the function $h(t) = -16t^2 + 30$, where t is time, in seconds. To catch the crab as it falls, a gull flies along a path represented by the function $g(t) = -8t + 15$. Using the pen tool, graphically illustrate if the gull will catch the crab before the crab hits the water.

$h(t) = -16t^2 + 30$

$g(t) = -8t + 15$

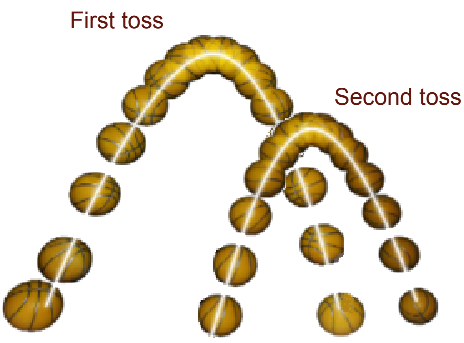


Click here for the solution.

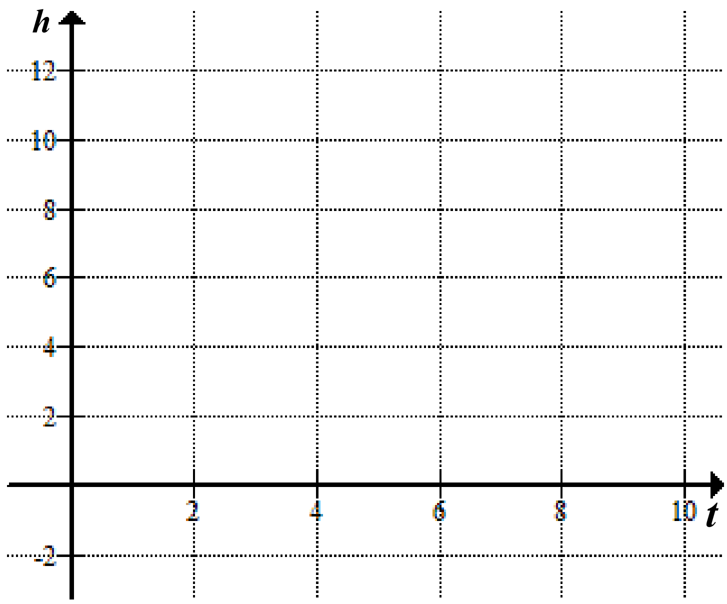
Chapter 8

Model a Situation with a Quadratic-Quadratic System of Equations

Chris and Ryan were given the task of plotting the path of a basketball, thrown from one end of the gym. They determined the equation of the path of the first toss to be $h(t) = -0.38(t - 4.6)^2 + 8$. A second toss could be modelled by the equation $h(t) = -0.8(t - 3.5)^2 + 10$, where t is the time in seconds and h is the height in feet. Using a system of equations, determine the time and height that the paths of the basketballs would have intersected for the first time, using the pen tool.



$$h(t) = -0.38(t - 4.6)^2 + 8$$
$$h(t) = -0.8(t - 3.5)^2 + 10$$



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