# More Trigonometric Applications

1) Suppose in between low and high tides, the water level varies 36 inches. Low tide occurs at 6am and high tide is at 4pm. Using the times and the amount the water level varies find a sine function that models the water level in inches above and below the average water level. Express the function in terms of time, in hours since 6:00 A.M.?

2) Alex swam from a beach to a nearby pier. He's trying to get out of the water by reaching up to the platform (where pedestrians walk) of the pier and pulling himself out of the water. He can reach a foot out of the water, but he is counting on the waves to move him high enough so that he can reach the platform. The top of the waves is 6 feet from the lowest part of the water every 4 seconds.

a) Write a sine function that describes the height of Alex's reach, h, as a function of time, t. For the sake of writing equation, write it as if Alex is at the average level of weight on his way up.

b) The platform that he needs to reach is 2 feet above the average height of the wave. How long is he within reach of the platform?

3) Consider the context of low and high tide throughout the day. Suppose that the water level varies 70 inches between low tide at 8:40 A.M. and high tide at 2:55 P.M.

a) What is a cosine functiont that models the variation in inches above and below the average water level as a function of the number of hours since 8:40 A.M.?

b) At what point in the cycle does the function cross the midline? What does the midline represent?