Name: **Date:**

Problem-Based Task: Timing the Tide

SMP	
1 ✓	2 ✓
3 ✓	4 ✓
5 ✓	6
7 ✓	8 ✓

The vertical distance between the deck of a large public pier and the surface of the ocean on the coast of Maine varies with the tide between a minimum of 6 feet and a maximum of 16 feet. Use a cosine function to develop a model for the vertical distance between the pier and the water as a function of time (measured in hours). As you develop the model, assume that the deck of the pier is at a height of 0 feet and, therefore, that the surface of the water at low tide is at a height of –16 feet. Assume that the first low tide occurs $t = 0$, and that high tides will occur at midnight (12:00 A.M.) and 12:30 P.M. on day 1. Simplify the model as much as possible. What will be the distance between the pier and the water at 9 A.M. on the third day?