The Pirate Problem

Name: _____

Pirates are crafty criminals. But the following parchment from the 1800's was discovered on an uninhabited island off the coast of Japan in 2009. It reads:

This is the island where I buried my treasure. It contains a single palm tree. Find the tree. Starting at the palm tree, walk directly to the falcon-shaped rock. Count your paces as you walk. Turn a quarter-circle to the right, and walk the same number of paces. When you reach the end, put a stick in the ground.

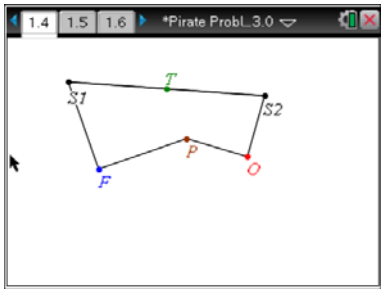
Return to the palm tree, and walk directly to the owl-shaped rock, again counting your paces. Turn a quarter-circle to the left, and walk the same number of paces. Put another stick in the ground.

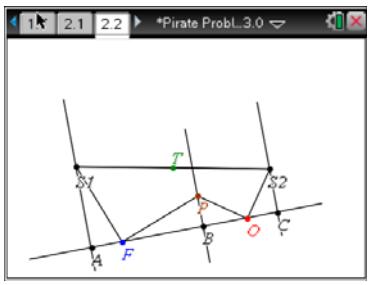
Connect the sticks with a rope, and dig beneath its midpoint to find the treasure.

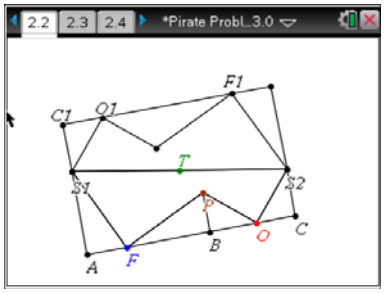
The rocks are still there, but there was no palm tree on the island. Can the treasure still be found? Finish the "treasure map" on p. 1.2 using the location of the rocks. Use Point P to represent where the tree might have been. Point F is the falcon rock and O is the owl rock. Label the first stick, S1; the second stick, S2; and the treasure, T. When done, investigate what happens when the palm tree moves (Drag point P) to a different location and answer the question on the following page 1.3.

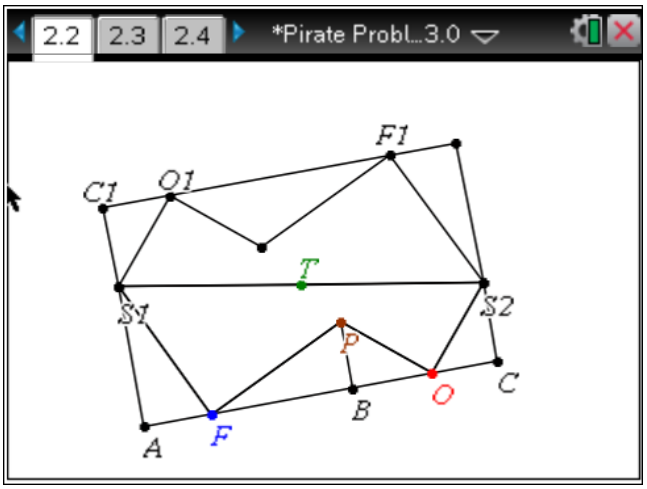
Continue investigating pages 1.4 through 1.7 answering the questions.

To find out what is really going on, starting with the original treasure map, we are dropping a perpendicular from each stick and from the palm tree to line segment $\overline{FO}$. The intersections are labeled A, B, and C respectively. Then the polygon AS1FPOS2C is rotated 180° about T. Record on page 2.3 your observations about what happened while moving the palm tree.









Prove that the height of the rectangle is the distance between the falcon-shaped rock and the owl-shaped rock. Use this worksheet to draft your thoughts. When you are satisfied with your proof, record it on page 3.2 of your Nspire.