Task
Search for Buried Treasure
Sample Solution

Route and Mode of Travel	Distance	Time Required
Start to east Mainland point. Travel by canoe.	Use the cosine ratio. $\cos 52^\circ = \frac{m}{4.6}$ $m \doteq 2.83$ Distance: 2.83 km	Time is distance divided by speed. $t = \frac{2.83}{4}$ $= 0.7075$ Time: 42 min, 27 s
East Mainland point to east river point. Hike and look out for snakes.	Determine the measure of the unknown angle at the river. 180° – 70° – 48° = 62° Use the sine law. $\frac{n}{\sin 70^\circ} = \frac{4.6}{\sin 62^\circ}$ $n \doteq 4.90$ Distance: 4.90 km	$t = \frac{4.90}{5}$ $= 0.98$ Time: 58 min, 48 s
Straight across the river. Travel by raft.	Use the cosine law. $c^2 = 1.9^2 + 2.3^2 - 2(1.9)(2.3)\cos 42^\circ$ $c \doteq 1.55$ Distance: 1.55 km	$t = \frac{1.55}{2}$ $= 0.775$ Time: 46 min, 30 s
River bank to spot marked X. Hike.	Use the sine law. $\frac{\sin b}{1.9} = \frac{\sin 96^\circ}{9}$ $b \doteq 12.1^\circ$ Use the sine law. $\frac{\sin a}{2} = \frac{\sin 78^\circ}{9}$ $a \doteq 12.6^\circ$ $a + b = 12.1 + 12.6$ $= 24.7$ Walk 24.7 m or approximately 0.025 km SE. Determine the measure of the third angle in the triangle. 180° – 12° – 96° = 72° Use the sine law. $\frac{x}{\sin 72^\circ} = \frac{9}{\sin 96^\circ}$ $x \doteq 8.61$ Distance: 8.61 km	$t = \frac{0.025}{5}$ $= 0.005$ Time: 18 s $t = \frac{8.61}{5}$ $= 1.722$ Time: 103 min, 19 s

	Total Distance: 17.92 km	**Total Time:** 4 h, 11 min