A boat B is anchored 2 miles from the nearest point P on a straight shore. A village V lies on the shore 6 miles from P. You swim at a fast 2 miles/hour from the boat B to a point Q on the shore (between P and the village V) and then walk at 5 miles/hour from Q to V. You wish to land at the point Q which gives the minimum total time \( t \) of the trip from the boat to the village. Find the distance \( x \) between P and Q. Omit the proof.

Picture: Draw the picture and indicate the variables.

Given and one variable(2): List the given facts (just one equation which is both the given fact and the one variable equation). Recall that distance = rate \( \times \) time. Hence time = distance \( \div \) rate. Write as a sum of two fractions, one with a radical: checksum=19

Domain: \( x \in [0, 6] \)

Diff(2). Find the derivative. 12 symbols, checksum=14.

Critical points(2):
endpoints: \( x = 0, 6 \)
\[
\frac{dt}{dx} \text{ d.n.e. never.}
\]

\[
\frac{dt}{dx} = 0: \text{A fraction with a radical in the denominator: 5 symbols, checksum=7.}
\]

Answer(1): Answer in English with units.

The distance between P and Q should be