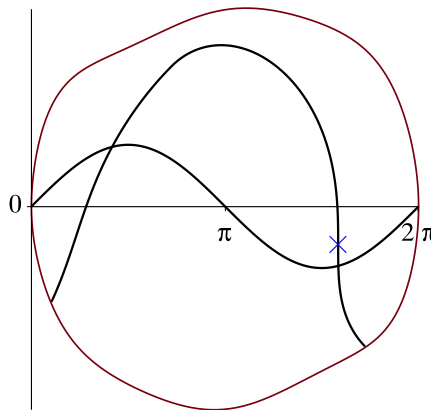


# WOBBLING BICYCLE

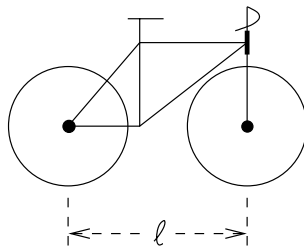
*Proposed by Luis Goddyn, Simon Fraser University, Burnaby, BC.*

A wobbling bicycle passes through a mud patch. One of its wheels traces a part of the curve  $y = \sin x$ . The other wheel makes a curve with a vertical inflection point.



How long is the bicycle?

In order to eliminate effects due to bicycle geometry, tilting and wheel size, assume the bicycle has vanishingly thin tires with its front axle always positioned directly below a vertical headset. Assume also that both wheels were in the mud patch when the inflection point is traversed. Determine the distance  $\ell$  between its axles.



*Editor's Comment.* This problem is related to a famous puzzle of determining in which way a bicycle was going from its tracks. You can find it in the book *Which Way Did the Bicycle Go?: And Other Intriguing Mathematical Mysteries* by Joseph D. E. Konhauser, Dan Velleman and Stan Wagon.

The solution to this puzzle will appear in *CruX* 42(5).

