The Shadow Puppets Problem

Adi was at his grandfather's house, and he was curious about the collection of characters his grandfather had on the wall. Adi's grandfather explained to him that shadow puppetry is a traditional Indonesian art form. In Balinese culture, a *dalang*, or puppeteer, puts on a puppet show to tell a story. The puppeteer uses a collection of puppets. The puppeteer sits on the floor and holds the puppets in front of an oil lamp. Their shadows are projected onto a white screen in front of the puppeteer. The audience sits on the other side of the screen to watch the story.



The puppets are part of the collection of Professor I Ketut Gede Asnawa. Photograph by Gloriana González.

Suppose that you are putting on a shadow puppet show. You are going to use a traditional Balinese puppet like the one below. You have a light source and a projector screen to project the puppet on.



Puppet from the collection of Professor I Ketut Gede Asnawa. Photograph by Gloriana González.

The puppet in the diagram is 18 inches long from the top of his hair to the bottom of his foot. The puppet is 7 inches across at his shoulders. Assume the puppet will be 24 inches away from the

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projector screen. Decide where to place the light source so that the shadow of the puppet's body on the screen is 34 inches long.

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