

# Physical Optimization Word Problems

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## Example

Suppose we have 2400 feet of fencing and we'd like to build a rectangular fence that encloses the most possible area. How can we do this?

## Example

Now suppose we have 2400 feet of fencing and we'd like to build a rectangular fence against a river, so we only need to build three sides. How can we enclose the most possible area?

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Suppose we want to construct a cylindrical can that holds one liter of liquid, and we want to use the least possible metal to construct the can—and thus build the can with the least possible surface area. We have

$$A = 2\pi r^2 + 2\pi rh.$$

## Example

Suppose a man wishes to cross a 20 m river and reach a house on the other side that is 48m downstream. The man can walk at 5 m/s or swim at 3 m/s. What is the optimal path for him to take to reach the house?