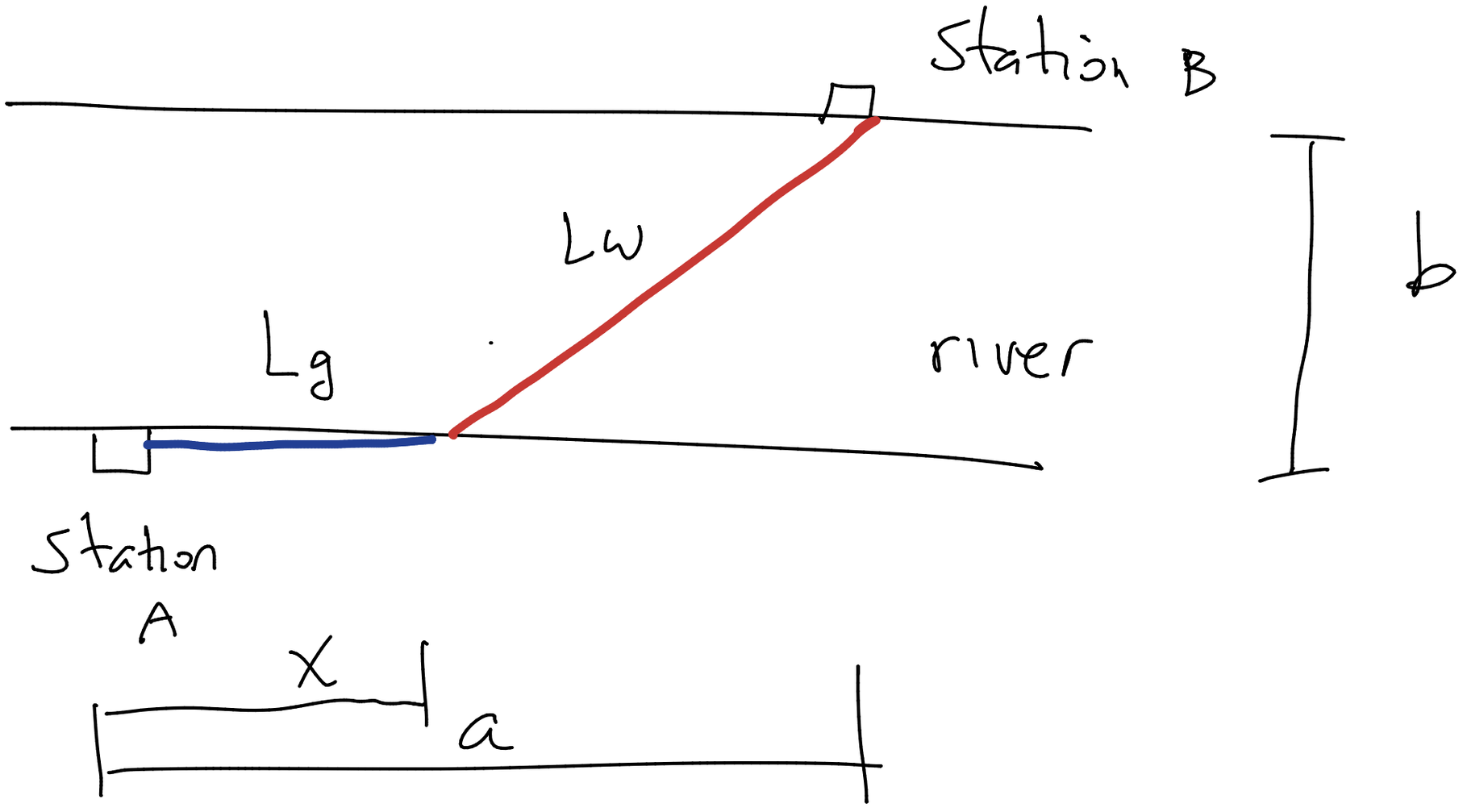
Optimization example



Determine the optimum value of x knowing:

price of cable over ground: P_g / unit length

price of cable over water: P_w / unit length

Minimize $J = P_g L_g + P_w L_w$

$= P_g(x) + P_w \sqrt{b^2 + (a-x)^2}$

- Unconstrained solution easy, with analytical solution.
- More difficult problem:

→

Price over water is variable:

$$P_w(x) = P_{ow} + S_w L_w(x)$$

Bounds on x: set value $\leq x \leq$ set value

$\rightarrow$ Use fmincon (see attached code)