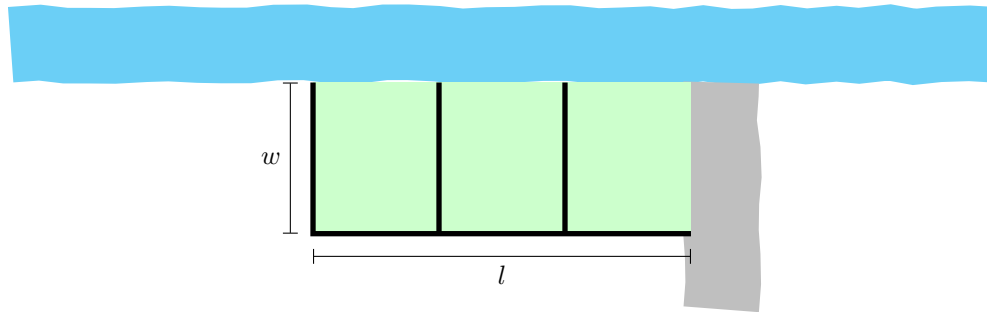You are the curator of an animal sanctuary, and you'd like to build three new rectangular pens for your furry friends. Funds are tight, and you decide to utilize a the corner of a stone wall on your property, so your 1800m of fencing encloses the largest possible area.

1. Express total area enclosed as a function of w.

2. Roughly sketch the graph of this function, labeling your axes. What dimensions will maximize the area enclosed by this newly built pen? Why must this be a maximum?