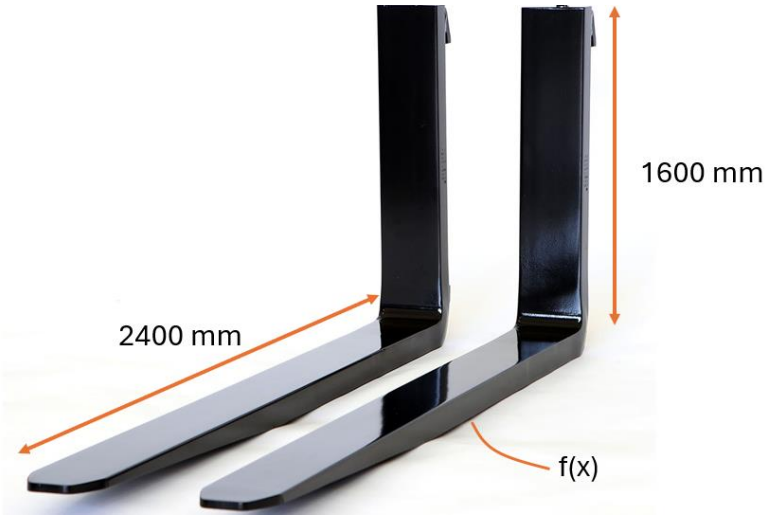
Mechanical Engineering Design I

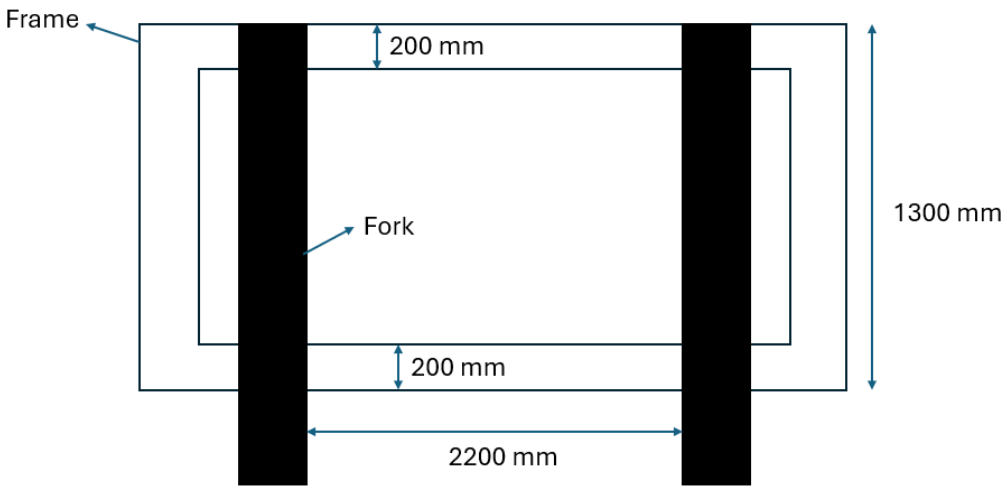
Project #1:

You have been asked to design the fork section of a forklift truck to lift 20' containers. The container (not shown in the figure) dimension is $6.10m\ long \times 2.44m\ width \times 2.59m\ high$. The rated capacity of the forks should be 25 ton in total. The forks are made by forging.

The distance between the forks during the operation could be 2200 m. Assume the constant width of 250 mm for the forks. The horizontal length would be 2400 mm.




Assume the forks are installed on a rigid rectangular frame (for the sake of simplicity).




Determine the profile shape function, f(x), also the thickness of the vertical section, all assuming infinite life safety factor of 1.5. The vertical section of the forks has a uniform section.