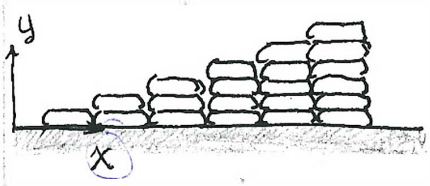
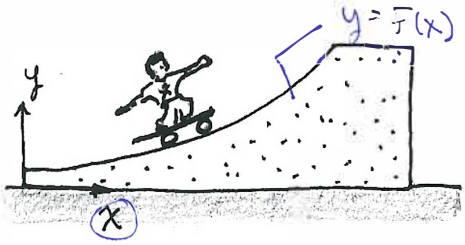
CONSIDER SANDBAGS -OR- A SKATE RAMP



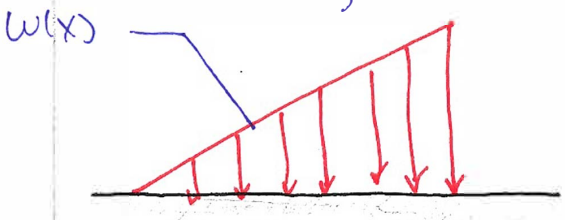


IN BOTH CASES THE FORCE EXERTED ON THE SURFACE BELOW IS A FUNCTION of DISTANCE (x).

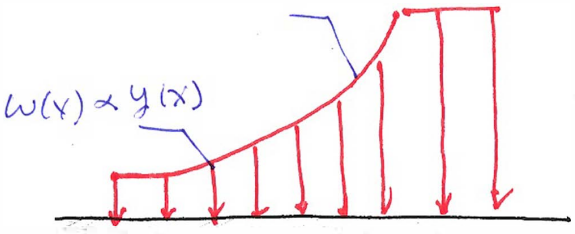
THESE ARE BOTH EXAMPLES of **DISTRIBUTED LOADS**

LET'S DRAW THESE LOADS*:

lb/ft, N/m etc.

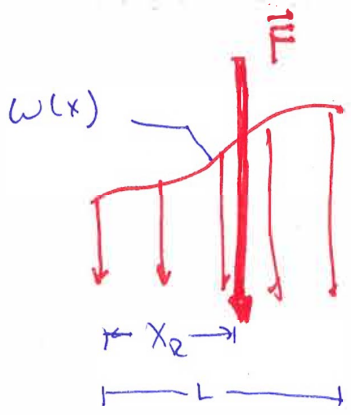


(SANDBAGS)



(SKATE RAMP)

How would you replace a distributed load with a single force?



MAGNITUDE → $|\vec{F}| = \int_0^L w(x)dx$ = AREA UNDER w(x)

LOCATION → x_R = CENTROID of  !!

* NOTE THAT WE CAN NOT TREAT 'THINGS' SUBJECT TO DISTRIBUTED LOADS AS PARTICLES.