How much force was placed on my back. object lifted on a 25 lb anchor was a 300 yardlong power cable. the weight per foot of cable was 7.97 lbs. per linear foot. the cable was lifted 62 feet to the surface of the water. I am 5 feet 7 inches tall and it took me 4 hours to lift it unaided. how much force and how much weight was placed on my back.

**Solution:**

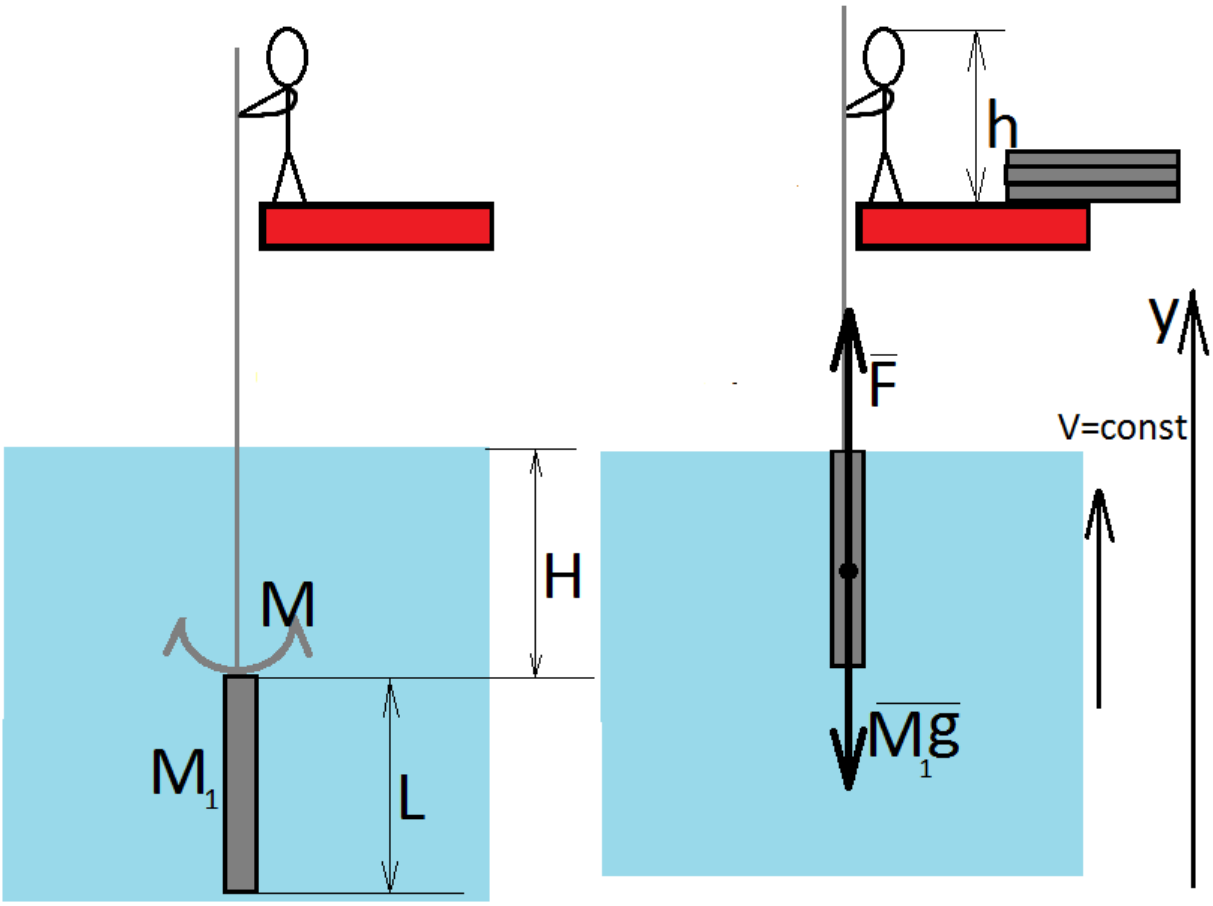
$L = 300yards = 274.32m - length\ of\ the\ cable$

$M = 25lb = 11.3\ kg - \ mass\ of\ the\ anchor$

$m = 7.97\frac{\text{lb}}{ft} = 3.61\frac{kg}{ft} = 11.84\frac{kg}{m}$ – weight per foot of cable

$H = 62\ ft = 18.9m - \ lifting\ height\ of\ the\ cable$

$h = 5\ feet\ 7\ unches = 1.7m - my\ height$




Total weight to be lifted:

$$M_1 = M_{anchor} + M_{cable} = M + m \cdot L = 11.3\ kg + 11.84\frac{kg}{m} \cdot 274.32m = 3259kg$$

Newton's second law along the Y-axis:

$$\vec{F} + \overrightarrow{M_1 g} = 0\ (a = 0, because\ V = constant)$$

$$y: F = M_1 g$$

$$F = 3259kg \cdot 9.8\frac{N}{kg} = 31938.2N$$

**Answer:** $M = 3259kg; F = 31938.2N$