## Answer on Question #40797 – Physics – Mechanics

A cyclist and cycle have a combined mass of 78 kg as they accelerate along a race track at 2.5 m/s2. Calculate the fore exerted as they accelerate. (F= 195 N) I solved this , but I do not know other one, which is :

A lift of mass 400 kg is accelerated upwards at 2 m/s2. calculate the force in the rope pulling.

## Solution:

Task 1

$$\begin{split} m &= 78 \text{ kg} - \text{mass of the cyclist and cycle;} \\ a &= 2.5 \frac{m}{s^2} - \text{acceleration of the cycle;} \end{split}$$

Newton's second law for the cycle along the X-axis:

x: F = ma = 78kg 
$$\cdot 2.5 \frac{m}{c^2} = 195 N$$

**Answer:** fore exerted as cyclist and cycle accelerate is equal to 195 *N*.

## **Task 2** m = 400 kg - mass of the lift; $g = 9.8 \frac{\text{m}}{\text{s}^2} - \text{acceleration due to gravity;}$ $a = 2 \frac{\text{m}}{\text{s}^2} - \text{acceleration of the lift;}$ Newton's second law for the lift along the Y-axis: F - mg = ma $F = \text{ma} + \text{ma} = \text{m}(a + g) = 400 \text{ kg} \left(9.8 \frac{\text{m}}{\text{s}^2} + 2 \frac{\text{m}}{\text{s}^2}\right) = 4720 \text{ N}$

Answer: the force in the rope pulling is equal to 4720 N.

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