## 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 $2.5 \mathrm{~m} / \mathrm{s} 2$. Calculate the fore exerted as they accelerate. ( $\mathrm{F}=195 \mathrm{~N}$ ) I solved this , but I do not know other one, which is :
A lift of mass 400 kg is accelerated upwards at $2 \mathrm{~m} / \mathrm{s} 2$. calculate the force in the rope pulling.

## Solution:

## Task 1

$\mathrm{m}=78 \mathrm{~kg}$ - mass of the cyclist and cycle;
$\mathrm{a}=2.5 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}-$ acceleration of the cycle;
Newton's second law for the cycle along the X -axis:

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

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

## Task 2

$\mathrm{m}=400 \mathrm{~kg}-$ mass of the lift;
$\mathrm{g}=9.8 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}-$ acceleration due to gravity;
$\mathrm{a}=2 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}$ - acceleration of the lift;
Newton's second law for the lift along the Y -axis:

$$
\mathrm{F}-\mathrm{mg}=\mathrm{ma}
$$

$$
\mathrm{F}=\mathrm{ma}+\mathrm{ma}=\mathrm{m}(\mathrm{a}+\mathrm{g})=400 \mathrm{~kg}\left(9.8 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}+2 \frac{\mathrm{~m}}{\mathrm{~s}^{2}}\right)=4720 \mathrm{~N}
$$

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

