## Answer on Question 64159, Physics, Other

## Question:

An elevator is moving upward at $0.96 \mathrm{~m} / \mathrm{s}$ when it experiences an acceleration $0.35 \mathrm{~m} / \mathrm{s}^{2}$ downward, over a distance of 0.71 m . What will its final velocity be?

## Solution:

We can find the final velocity of an elevator from the kinematic equation:

$$
v_{f}^{2}=v_{i}^{2}+2 a s,
$$

here, $v_{f}$ is the final velocity of the elevator, $v_{i}$ is the initial velocity of the elevator, $a$ is the acceleration of the elevator (acceleration will be with sign minus because it directed downward), $s$ is the distance travelled by elevator.

From this formula we can find $v_{f}$ :

$$
v_{f}=\sqrt{v_{i}^{2}-2 a s}=\sqrt{\left(0.96 \frac{\mathrm{~m}}{\mathrm{~s}}\right)^{2}-2 \cdot 0.35 \frac{\mathrm{~m}}{\mathrm{~s}^{2}} \cdot 0.71 \mathrm{~m}}=0.65 \frac{\mathrm{~m}}{\mathrm{~s}}
$$

## Answer:

$$
v_{f}=0.65 \frac{\mathrm{~m}}{\mathrm{~s}}
$$

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