Answer on Question #48290, Physics, Mechanics | Kinematics | Dynamics

If a lift goes up and down with constant velocity then how the time period change? When it will decrease or increase?

If the lift moves with constant acceleration then how the time period will change? Please explain in both questions.

Solution:

In first case, when a lift goes with constant velocity the period of pendulum will be

$$T = 2\pi\sqrt{\frac{L}{g}},$$

where g is the acceleration due to gravity.

Period of pendulum in second case depends from circumstances when the lift acceleration coincides with the gravitational acceleration or not. When the acceleration is coincide with free fall acceleration the period is going to be larger:

$$T = 2\pi\sqrt{\frac{L}{g-a}},$$

otherwise it will decrease

$$T = 2\pi\sqrt{\frac{L}{g+a}}.$$