

A warehouse worker uses a forklift to raise a crate of pickles on a platform to a height 2.75 m above the floor. The combined mass of the platform and the crate is 207 kg. If the power expended by the forklift is 1440 W, how long does it take to lift the crate?

Power equals:

$$P = \frac{W}{\Delta t}$$

where $W = \Delta E$ – work of the forklift, in the context of energy conversion equals change of body's energy, Δt – time.

$$\Delta t = \frac{\Delta E}{P}$$

Change of body's energy equals:

$$\Delta E = mgh$$

Therefore:

$$\Delta t = \frac{mgh}{P} = \frac{207 \text{ kg} * 2.75 \text{ m} * 9.81 \text{ m/s}^2}{1440 \text{ W}} = 3.88 \text{ s}$$

Answer: 3.88 s