

Supplementary Problem V for Physics 6 (from an old exam)

Bernice pushes a heavy crate across the horizontal floor of her lab. There is friction between the crate and the floor. During a particular interval, the crate moves a distance Δx toward the back of the lab, moving at a **constant velocity** the entire time. For each question below, choose an answer and **explain** why it is correct. (This is a purely conceptual problem; you do not need to calculate anything, though you may wish to refer to certain equations in your explanations.)

a) Is the work done by Bernice on the crate positive, negative, or zero?

b) Is the work done by the frictional force on the crate positive, negative, or zero?

c) Is the work done by gravity on the crate positive, negative, or zero?

d) Is the *total* work done on the crate positive, negative, or zero?