Answer on Question 49700, Physics, Mechanics | Kinematics | Dynamics

Question:

You push your physics book 1.5 meters along a horizontal table top with a horizontal force of 2.40N. The opposing force of friction is 0.60N.
a) How much work does your 2.40N force do on the book?
b) What is the work done on the book by the friction force?
c) What is the total work done on the book?

Solution:

a) The work done on the book by the horizontal force:

$$W_h = F_h s = 2.4N \cdot 1.5m = 3.6J.$$

b) Similarly, we obtain the work done on the book by the friction force (we take the friction force with sign minus because it have opposing direction to the horizontal force):

$$W_{fr} = F_{fr} s = -0.6N \cdot 1.5m = -0.9J.$$

c) The total work done on the book:

$$W_{total} = W_h + W_{fr} = 3.6J - 0.9J = 2.7J.$$

Answer:

a) $W_h = 3.6J.$

b) $W_{fr} = -0.9J.$

c) $W_{total} = 2.7J.$