a person holds ablock weighing 4kg between his hands and keeps it from falling down by pressing it with his hands .if the force exerted by each hand is 50n,find the coefficient of friction between the hand and the block.

Solution:

$F_1 = F_2 = 50N - \text{pressing force};$

$m = 4kg - \text{mass of the adblock};$

First, we can find the reaction force that acts on the block (hands are symmetrical, so we can consider only one hand):

Newton's third law along the X-axis:

$F_1 = N_1;$

$F_2 = N_2;$

The first law of equilibrium along the Y-axis:

$mg - F_{fr1} - F_{fr2} = 0 \qquad (1)$

Formula for the friction force:

$F_{friction} = \mu N \quad , \text{where } \mu - \text{coefficient of friction} \Longrightarrow$

$F_{fr1} = \mu N_1 = \mu F_1 \qquad (2)$

$F_{fr2} = \mu N_2 = \mu F_2 \qquad (3)$

$(3) \text{and} (2) \text{in} (1):$

$mg - \mu F_1 - \mu F_2 = 0$

$$\mu = \frac{mg}{F_1 + F_2} = \frac{4kg \cdot 9.8\frac{N}{kg}}{2 \cdot 50N} = 0.4$$

Answer: coefficient of friction is 0.4.