

What is the acceleration of a block ($m = 0.5 \text{ kg}$) which is being pulled in opposite directions by two children? Sean pulls 3.0 N left and Dianne pulls 5.0 N right. Also how far will it move after three seconds? ($\mu = 0$)

PART A Dynamics

$$F_n = F_D - F_S$$

$$= 5.0 - 3.0 = 2.0 \text{ N}$$

$$F_n = ma$$

$$a = \frac{F_n}{m} = \frac{2.0 \text{ N}}{0.5 \text{ kg}} = 4.0 \frac{\text{m}}{\text{s}^2}$$

PART B Kinematics

$$d = \frac{1}{2}at^2$$

$$= \frac{1}{2}(4.0)(3)^2$$

$$= 18.0 \text{ m}$$

$v_f = 12 \frac{\text{m}}{\text{s}}$

$t = 3 \text{ s}$

$a = 4.0$

$v_i = 0$

$\mu = 0$

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